Town of Exeter, NH

Natural Hazard Mitigation Plan Update 2013

Approved by the

Exeter Board of Selectmen

April 15, 2013

Prepared with the Assistance of the

Rockingham Planning Commission

This project was partially funded by

NH Homeland Security and Emergency Management

CERTIFICATE OF ADOPTION

Town of Exeter, New Hampshire
Board of Selectmen
A Resolution Adopting the Exeter Natural Hazard Mitigation Plan Update
4/15, 2013

WHEREAS, the Town of Exeter received funding from the NH Office of Homeland Security and Emergency Management under a Flood Mitigation Assistance Project Grant and assistance from Rockingham Planning Commission in the preparation of the Exeter Hazard Mitigation Plan; and

WHEREAS, several public planning meetings were held between September 2011 and January 2012 regarding the development and review of the 2013 Exeter Hazard Mitigation Plan Update; and

WHEREAS, the Exeter Hazard Mitigation Plan Update contains several potential future projects to mitigate hazard damage in the Town of Exeter; and

WHEREAS, a duly-noticed public hearing was held by the Exeter Board of Selectmen on 5/22/12 to formally approve and adopt the Exeter Hazard Mitigation Plan Update.

NOW, THEREFORE BE IT RESOLVED that the Exeter Board of Selectmen adopts the Exeter Hazard Mitigation Plan Update.

ADOPTED AND SIGNED this 15 day of Apr. 1 2013.

Exeter Board of Selectmen Chair

ATTEST

Public Notary

RUSSELL J. DEAN, Notary Public
My Commission Expires March 7, 2017

TABLE OF CONTENTS

LIST OF MAPS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

The *Exeter Hazard Mitigation Plan* (herein also referred to as the *Plan*) was compiled to assist the Town of Exeter in reducing and mitigating future losses from natural hazard events. The *Plan* was developed by the Rockingham Planning Commission and participants from the Town of Exeter *Natural Hazard Mitigation Committee* and contains the tools necessary to identify specific hazards, and aspects of existing and future mitigation efforts.

The following *natural* hazards are addressed:

- Flooding
- Hurricane-High Wind Event
- Severe Winter Weather
- Wildfire
- Earthquake

The list of *critical facilities* includes:

- Municpal facilities;
- Communication facilities;
- Fire stations and law enforcement facilities;
- Schools;
- Shelters;
- Evacuation routes; and
- Vulnerable Populations

The *Exeter Hazard Mitigation Plan* is considered a work in progress and should be revisited frequently to assess whether the existing and suggested mitigation strategies are successful. Copies have been distributed to the Town Hall and the Emergency Operations Center. A copy of the *Plan* is also on file at The Rockingham Planning Commission, New Hampshire Homeland Security and Emergency Management (NHHSEM) and the Federal Emergency Management Agency (FEMA). This Document was approved by both agencies prior its adoption at the local level.

CHAPTER I. INTRODUCTION

Background

The New Hampshire Homeland Security and Emergency Management (NHHSEM) has a goal for all communities within the State of New Hampshire to establish local hazard mitigation plans as a means to reduce and mitigate future losses from natural hazard events. The NHHSEM outlined a process whereby communities throughout the State may be eligible for grants and other assistance upon completion of a local hazard mitigation plan. A handbook entitled *Hazard Mitigation Planning for New Hampshire Communities* was created by NHHSEM to assist communities in developing local plans. The State's Regional Planning Commissions are charged with providing assistance to selected communities to develop local plans.

The *Exeter Hazard Mitigation Plan* was prepared by participants from the Town of Exeter Hazard Mitigation Team with the assistance and professional services of the Rockingham Planning Commission (RPC) under contract with the New Hampshire Homeland Security and Emergency Management operating under the guidance of Section 206.405 of 44 *CFR* Chapter 1 (10-1-97 Edition). The *Exeter Hazard Mitigation Plan* serves as a strategic planning tool for use by the Town of Exeter in its efforts to identify and mitigate the future impacts of natural and/or man-made hazard events.

Methodology

On September 16, 2011, the Rockingham Planning Commission (RPC) organized the first meeting with emergency management officials from the Town of Exeter to begin the initial planning stages of the *Plan Update (primarily step 1)*. This meeting precipitated the development of the *Natural Hazards Mitigation Committee* (herein after, the *Committee*). RPC and participants from the Town developed the content of the *Plan* using the ten-step process set forth in the *Hazard Mitigation Planning for New Hampshire Communities*. The following is a summary of the ten-step process conducted to compile the *Plan*. Publicly noticed work session meetings were also held on October 19, 2011, November 8, 2011, December 6, 2011, January 3 and 18th 2012.

Step 1- Form the Committee

As stated above prior to the first meeting RPC contacted the EMD of Exeter. Members of the community were invited by the EMD by voice contact as well as invite letter to join the Exeter Hazard Mitigation Committee including the Police Chief, Fire Chief, Planning Board and Selectboard representatives, Department of Public Works, Exeter school district representatives, NHHSEM and neighboring town emergency representatives. Public notices, per NH RSA 91-A were posted on the town website and two other public viewing sites including but not limited to the Town Offices, Public Safety Complex and Public Library to inform residents about the planning process, to participate, and possibly become a member of the planning process. The initial meeting was held on October 19, 2011 to introduce the Mitigation Planning Process to the possible committee. Those that responded and participated on the committee are listed under acknowledgments on page 6. Although participation was sought from other agencies, neighboring towns and the public only the participating members mentioned on page 6 participated in this plan update.

Step 2 – Map the Hazards

Participants in the *Committee* identified areas where damage from historic natural disasters have occurred and areas where critical man-made facilities and other features may be at risk in the future for loss of life, property damage, environmental pollution and other risk factors. RPC generated a set of base maps with GIS (Geographic Information Systems) that were used in the process of identifying past and future hazards.

Step 3 – Identify Critical Facilities and Areas of Concern

Participants in the Committee then identified facilities and areas that were considered to be important to the Town for emergency management purposes, for provision of utilities and community services, evacuation routes, and for recreational and social value. Using a Global Positioning System, RPC plotted the exact location of these sites on a map. Digital images were collected for each Critical Facility using Pictometry™ software and images of the Town of Exeter.

Step 4 – Identify Existing Mitigation Strategies

After collecting detailed information on each critical facility in Exeter, the Committee and RPC staff identified existing Town mitigation strategies relative to flooding, wind, fire, ice and snow events and earthquakes.

Step 5 – Identify the Gaps in Existing Mitigation Strategies

The existing strategies were then reviewed by the RPC and the Committee for coverage and effectiveness, as well as the need for improvement.

Step 6 – Identify Potential Mitigation Strategies

A list was developed of additional hazard mitigation actions and strategies for the Town of Exeter. The existing Hazard Mitigation Plans of Portsmouth, North Hampton and Rye were just a few towns that were utilized to identify new mitigation strategies as well as the town Master Plan, Emergency Operation Plan, and Capital Improvements Plan.

Step 7 – Prioritize and Develop the Action Plan

The proposed hazard mitigation actions and strategies were reviewed and each strategy was rated (good, average, or poor) for its effectiveness according to several factors (*e.g.*, technical and administrative applicability, political and social acceptability, legal authority, environmental impact, financial feasibility). Each factor was then scored and all scores were totaled for each strategy. Strategies were ranked by overall score for preliminary prioritization then reviewed again under Step 8.

Step 8 - Determine Priorities

The preliminary prioritization list was reviewed in order to make changes and determine a final prioritization for new hazard mitigation actions and existing protection strategy improvements identified in previous steps. RPC also presented recommendations to be reviewed and prioritized by emergency management officials.

Step 9 - Develop Implementation Strategy

Using the chart provided under Step 9 in the handbook, an implementation strategy was created which included person(s) responsible for implementation (who), a timeline for completion (when), and a funding source and/or technical assistance source (how) for each identified hazard mitigation actions. Also, when the Master Plan or the Exeter Capital Improvement Plan (CIP) is updated the *Exeter Hazard Mitigation Plan* shall be consulted to determine if strategies or actions suggested in the *Plan* can be incorporated into the Town's future land use recommendations and or capital expenditures.

Step 10 - Adopt and Monitor the *Plan*

RPC staff compiled the results of Steps 1 to 9 in a draft document. This draft *Plan* was reviewed by members of the Committee and by staff members at the RPC. RPC staff compiled the results of Steps 1 to 8 in a draft document. This draft *Plan* was reviewed by members of the Committee and by staff members at the RPC. The draft *Plan* was also placed on the RPC website for review by the public, neighboring communities, agencies, businesses, and other interested parties to review and make comments via email. A duly noticed public meeting was held by the Exeter Board of Selectmen on May 21, 2012. The meeting allowed the community and neighboring towns to provide comments and suggestions for the *Plan* in person, prior to the document being finalized. After the meeting it was decided the plan be posted on the town website for further public comment and another Selectmen's hearing was held on June 11, 2012 to review, if any, comments from the town and surrounding areas. It also allowed board and committee members to review other planning documents in town such as the Master Plan and CIP to consider and incorporate pertinent information that may be included within the Hazard Mitigation Plan. The draft was revised to incorporate comment from the Selectmen, Planning Board and general public; then submitted to the NH HSEM and FEMA Region I for their review and comments. Any changes required by NH HSEM and FEMA were made and a revised draft document was then submitted to the Exeter Board of Selectmen for their final review. A public hearing was then held by the Exeter Board of Selectmen on _____. At this public hearing the *Plan* was approved and adopted by the Board of Selectman.

Hazard Mitigation Goals and Objectives of the State of New Hampshire

The *State of New Hampshire Natural Hazards Mitigation Plan,* which was prepared and is maintained by the New Hampshire Bureau of Emergency Management (NH BEM), sets forth the following related to overall hazard mitigation goals and objectives for the State of New Hampshire:

1. To improve upon the protection of the general population, the citizens of the State and guests, from all natural and man-made hazards.
2. To reduce the potential impact of natural and man-made disasters on the State's Critical Support Services.
3. To reduce the potential impact of natural and man-made disasters on Critical Facilities in the State.
4. To reduce the potential impact of natural and man-made disasters on the State's infrastructure.
5. To improve Emergency Preparedness and to improve and maintain evacuation routes through town.
6. Improve the State's Disaster Response and Recovery Capability.
7. To reduce the potential impact of natural and man-made disasters on private property.
8. To reduce the potential impact of natural and man-made disasters on the State's economy.
9. To reduce the potential impact of natural and man-made disasters on the State's natural environment.
10. To reduce the State's liability with respect to natural and man-made hazards generally.
11. To reduce the potential impact of natural and man-made disasters on the State's specific historic treasures and interests as well as other tangible and intangible characteristics which add to the quality of life of the citizens and guests of the State.
12. To identify, introduce and implement cost effective Hazard Mitigation measures so as to accomplish the State's Goals and Objectives and to raise the awareness of, and acceptance of Hazard Mitigation generally.

Through the adoption of this Plan the Town of Exeter concurs and adopts these goals and objectives.

Acknowledgements

The Exeter Board of Selectmen extends special thanks to those that assisted in the development of this *Plan* update by serving as member of Natural Hazards Mitigation Committee:

Russell Dean, Exeter Town Manager
Jennifer Perry, Exeter Public Works Director
Ray LeBlanc, Exeter Hospital Administrator
Susan Baillargon, Exeter Fire Administration
Eric Wilking, Exeter Assistant Fire Chief/Deputy EMD
Mary Cook, Exeter Public Health Administrator
Ken Berkenbush, Assistant Fire Chief/Exeter health Officer
Brian Comeau, Exeter Emergency Management Director/Fire Chief

The Exeter Board of Selectmen offers thanks to the **NHHSEM** (http://www.nh.gov/safety/divisions/hsem/index.html) which provided the model and funding for this *Plan*.

In addition, thanks are extended to the staff of the **Rockingham Planning Commission** for professional services, process facilitation and preparation of this document.

CHAPTER II. COMMUNITY PROFILE

Natural Features

The Town of Exeter is located in New Hampshire in Rockingham County. Exeter is bordered by Kingston, East Kingston, Hampton Falls, Hampton, and Kensington to the south, Stratham to the east, Newfields to the north, and Brentwood and Epping to the west, as seen below in Figure 1. The town was founded in 1638. From 2000 to 2010, Exeter's population decreased by 5.3 percent. According to NH Employment Security the median age is 46.6 years and according to Census 2010 data 22.1 percent of the population is under the age of 18 and 15.4 percent of the population is 65 years and older. According to the American Community Survey, as of 2010 there were 6,759 housing units. All figures presented herein were considered accurate for this plan update.

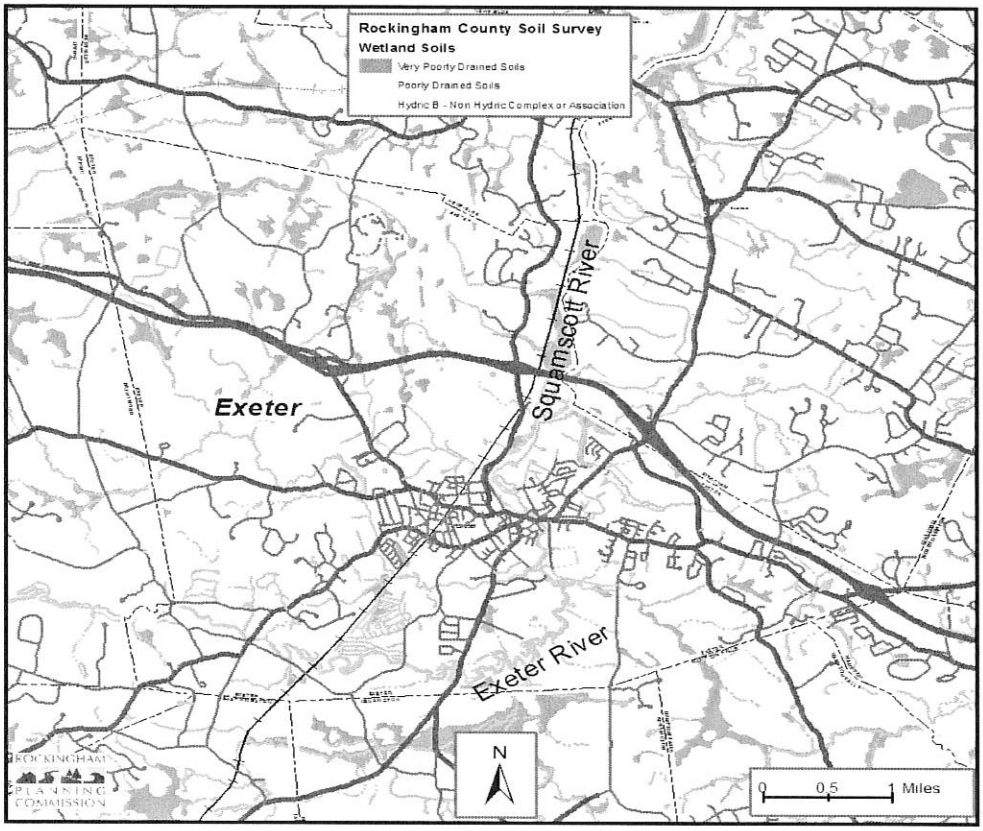
Figure 1: Location Map of Exeter, New Hampshire

Figure 2: Watershed Map of Exeter, New Hampshire.

Exeter has portions of four regional watersheds: the Piscassic River, Exeter River, the tidal Squamscott River, and the Coastal Watershed. The first three watersheds are part of the larger Piscataqua River Basin, while the Coastal Watershed is part of the larger Coastal River Basin. In an effort to delineate meaningful drainage patterns, two sub-watersheds were identified in the 1994 Exeter Master Plan. The first is the Dearborn Brook Sub-Watershed which forms a portion of the Squamscott River Watershed, and the second is the Little River Sub-Watershed which forms a portion of the Exeter River Watershed. **Figure 2** shows the Watershed Boundaries in the Town of Exeter.

Wetlands are an important part of the Town of Exeter's surface water. Wetland, or hydric, soils include poorly and very poorly drained soils. These soil types are often associated with marine silts and clays where the water table is at or near the surface for five to nine months of the year. Exeter has mapped and identified Prime Wetlands in the community and has adopted stricter land use regulations for work adjacent to prime wetlands.

Figure 3: Wetlands Map of Exeter, New Hampshire. Wetland delineated as poorly and very poorly drained soils, and Wetlands from the National Wetland Inventory.



Floodplains for this *Plan* are defined as the 100-year and 500-year flood hazard zones, as depicted on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). Floodplains in the Town of Exeter are shown below in Figure 4. Exeter maintains participation in the National Flood Insurance Program administered by FEMA. Development should be located away from wetlands and floodplains whenever possible. The filling of wetlands for building construction not only destroys wetlands and their numerous benefits, but may also lead to groundwater contamination. Building within a flood zone may also reduce the floodplain's capacity to absorb and retain water during periods of excessive precipitation and runoff. Moreover, in regard to building within floodplains, contamination may result from flood damage to septic systems.

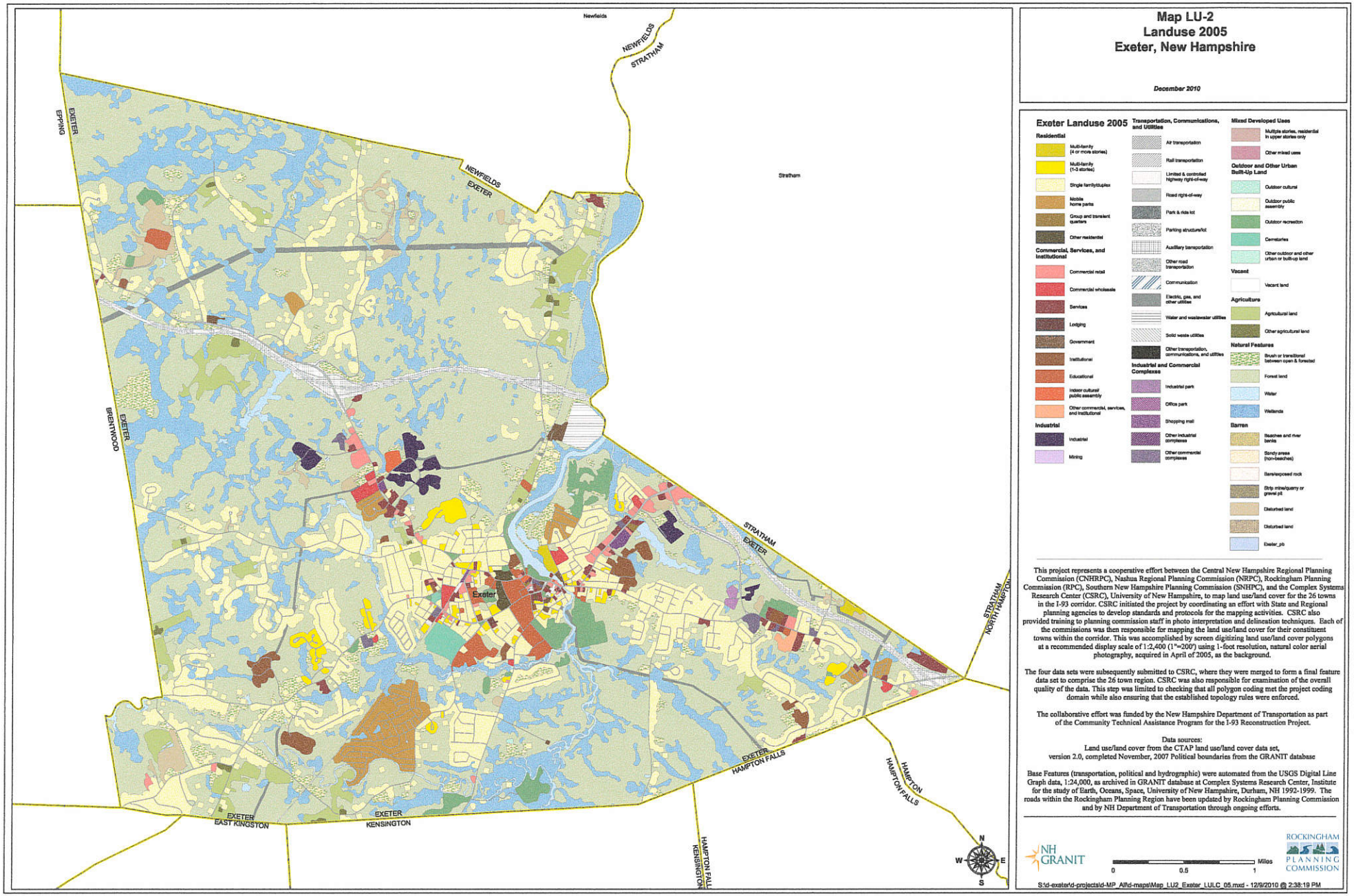
Figure 4: Floodplains of Exeter, New Hampshire

Current and Future Development Trends

Current Development is predicated on the Town of Exeter's Zoning Ordinance. The Town is divided into 24 zoning districts including overlays. For more information on these specific zones see the Exeter Zoning Ordinance. Map 1 – Existing Land Use shows current land use as defined by Exeter's current Existing Land Use chapter of the Master Plan.

The Town of Exeter completed a build-out analysis in 2006 to assist with planning efforts (as is still pertinent for this plan update). The general parameters of expected growth are outlined in the Exeter Master Plan. The expected population for the year 2020 is estimated to be 16,776 by the New Hampshire Office of Energy and State Planning. Commercial growth is expected to continue to be concentrated along Routes 27 and 108 and to include the renovation and replacement of some businesses in the downtown historic district. From 2006-2011, 82 single family and 12 multi-family residential units were constructed. During that same time period 24 new commercial buildings were also built. During this same time period the town of Exeter has not experienced building activity within the designated 100 year flood zone. In the future, Exeter

building officials will continue to monitor building activity within these flood potential areas of town.



Map LU-2
Landuse 2005
Exeter, New Hampshire

December 2010

Exeter Landuse 2005

Residential
- Multi-family (4 or more stories)
- Multi-family (1-3 stories)
- Single family/duplex
- Mobile home parks
- Group and transient quarters
- Other residential

Commercial, Services, and Institutional
- Commercial retail
- Commercial wholesale
- Services
- Lodging
- Government
- Institutional
- Educational
- Indoor cultural/ public assembly
- Other commercial, services, and institutional

Industrial
- Industrial
- Mining

Transportation, Communications, and Utilities
- Air transportation
- Rail transportation
- Limited & controlled highway right-of-way
- Road right-of-way
- Park & ride lot
- Parking structure/lot
- Auxiliary transportation
- Other road transportation
- Communication
- Electric, gas, and other utilities
- Water and wastewater utilities
- Solid waste utilities
- Other transportation, communications, and utilities

Industrial and Commercial Complexes
- Industrial park
- Office park
- Shopping mall
- Other industrial complexes
- Other commercial complexes

Mixed Developed Uses
- Multiple stories, residential in upper stories only
- Other mixed uses

Outdoor and Other Urban Built-Up Land
- Outdoor cultural
- Outdoor public assembly
- Outdoor recreation
- Cemeteries
- Other outdoor and other urban or built-up land

Vacant
- Vacant land

Agriculture
- Agricultural land
- Other agricultural land

Natural Features
- Brush or transitional between open & forested
- Forest land
- Water
- Wetlands

Barren
- Beaches and river banks
- Sandy areas (non-beaches)
- Bare/exposed rock
- Strip mine/quarry or gravel pit
- Disturbed land
- Disturbed land
- Exeter_pb

This project represents a cooperative effort between the Central New Hampshire Regional Planning Commission (CNHRPC), Nashua Regional Planning Commission (NRPC), Rockingham Planning Commission (RPC), Southern New Hampshire Planning Commission (SNHPC), and the Complex Systems Research Center (CSRC), University of New Hampshire, to map land use/land cover for the 26 towns in the I-93 corridor. CSRC initiated the project by coordinating an effort with State and Regional planning agencies to develop standards and protocols for the mapping activities. CSRC also provided training to planning commission staff in photo interpretation and delineation techniques. Each of the commissions was then responsible for mapping the land use/land cover for their constituent towns within the corridor. This was accomplished by screen digitizing land use/land cover polygons at a recommended display scale of 1:2,400 (1"=200') using 1-foot resolution, natural color aerial photography, acquired in April of 2005, as the background.

The four data sets were subsequently submitted to CSRC, where they were merged to form a final feature data set to comprise the 26 town region. CSRC was also responsible for examination of the overall quality of the data. This step was limited to checking that all polygon coding met the project coding domain while also ensuring that the established topology rules were enforced.

The collaborative effort was funded by the New Hampshire Department of Transportation as part of the Community Technical Assistance Program for the I-93 Reconstruction Project.

Data sources:
Land use/land cover from the CTAP land use/land cover data set, version 2.0, completed November, 2007 Political boundaries from the GRANIT database

Base Features (transportation, political and hydrographic) were automated from the USGS Digital Line Graph data, 1:24,000, as archived in GRANIT database at Complex Systems Research Center, Institute for the study of Earth, Oceans, Space, University of New Hampshire, Durham, NH 1992-1999. The roads within the Rockingham Planning Region have been updated by Rockingham Planning Commission and by NH Department of Transportation through ongoing efforts.

NH GRANIT

0 0.5 1 Miles

ROCKINGHAM PLANNING COMMISSION

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CHAPTER III. NATURAL HAZARDS IN THE TOWN OF EXETER

What are the Hazards?

The first step in planning for natural hazard mitigation is to identify hazards that may affect the Town. Some communities are more susceptible to certain hazards (i.e., flooding near rivers, hurricanes on the seacoast, etc.). The Town of Exeter is prone to several types of natural hazards. These hazards include: flooding, hurricanes or other high-wind events, severe winter weather, wildfires and earthquakes. Other natural hazards can and do affect the Town of Exeter, but these were the hazards prioritized by the Committee for mitigation planning. These were the hazards that were considered to occur with regularity and/or were considered to have high damage potential, and are discussed below.

Natural hazards that are included in the State's Hazard Mitigation Plan that are not included in the *Plan* include: drought, extreme heat, landslide, subsidence, radon and avalanche. Subsidence and avalanche are rated by the State as having Low and No risk in Rockingham County, respectively; due to this they were left out of the *Plan*. Exeter has no record of landslides and little chance of one occurring that could possibly damage property of cause injury; so landslides were not included in this *Plan*. The State's Plan indicates that Rockingham County is at Moderate risk to drought, extreme heat, and radon; these hazards were not included in the *Plan*. When compared natural hazards that could be potentially devastating to the Town (earthquakes or hurricanes) or natural hazards that occur with regularity (flooding or severe winter weather) it was not considered an effective us of the Committee time to include drought, extreme heat, and radon in the *Plan* at this time. When the *Plan* is revised and updated in the future, possible inclusion of these hazards will be reevaluated. The 2012 plan update review committee assessed the 2005 plan and decided that all hazards as defined within are still pertinent and relevant for the 2012 update.

Definitions of Natural Hazards

Flooding

Floods are defined as a temporary overflow of water onto lands that are not normally covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges, and/ or inadequate local drainage. Floods can cause loss of life, property damage, crop/livestock damage, and water supply contamination. Floods can also disrupt travel routes on roads and bridges.

Inland floods are most likely to occur in the spring due to the increase in rainfall and melting of snow; however, floods can occur at any time of the year. A sudden thaw in the winter or a major downpour in the summer can cause flooding because there is suddenly a lot of water in one place with nowhere to go.

100-year Floodplain Events

Floodplains are usually located in lowlands near rivers, and flood on a regular basis. The term 100 year flood does not mean that flood will occur once every 100 years. It is a statement of probability that scientists and engineers use to describe how one flood compares to others that are likely to occur. It is more accurate to use the phrase "1% annual chance flood". What this means is that there is a 1% chance of a flood of that size happening in any year.

Erosion and Mudslides
Erosion is the process of wind and water wearing away soil. Typically in New Hampshire, the land along rivers is relatively heavily developed. Mudslides may be formed when a layer of soil atop a slope becomes saturated by significant precipitation and slides along a more cohesive layer of soil or rock. Erosion and mudslides become significant threats to development during floods. Floods speed up the process of erosion and increase the risk of mudslides.

Rapid Snow Pack Melt
Warm temperatures and heavy rains cause rapid snowmelt. Quickly melting snow coupled with moderate to heavy rains are prime conditions for flooding.

River Ice Jams
Rising waters in early spring often breaks ice into chunks, which float downstream and often pile up, causing flooding. Small rivers and streams pose special flooding risks because they are easily blocked by jams. Ice in riverbeds and against structures present significant flooding threats to bridges, roads, and the surrounding lands.

Dam Breach and Failure
Dam failure results in rapid loss of water that is normally held by the dam. These kinds of floods are extremely dangerous and pose a significant threat to both life and property.

Severe Storms
Flooding associated with severe storms can inflict heavy damage to property. Heavy rains during severe storms are a common cause of inland flooding.

Hurricane-High Wind Events

Significantly high winds occur especially during hurricanes, tornadoes, winter storms and thunderstorms. Falling objects and downed power lines are dangerous risks associated with high winds. In addition, property damage and downed trees are common during high wind occurrences.

Hurricanes
A hurricane[1] is a tropical cyclone in which winds reach speeds of 74 miles per hour or more and blow in a large spiral around a relatively calm center. The eye of the storm is usually 20-30 miles wide and may extend over 400 miles. High winds are a primary cause of hurricane-inflicted loss of life and property damage.

Tornadoes
A tornado is a violent windstorm characterized by a twisting, funnel shaped cloud. They develop when cool air overrides a layer of warm air, causing the warm air to rise rapidly. The atmospheric conditions required for the formation of a tornado include great thermal

[1] The Saffir/Simpson Hurricane Scale can be viewed in Appendix C

instability, high humidity and the convergence of warm, moist air at low levels with cooler, drier air aloft. Most tornadoes remain suspended in the atmosphere, but if they touch down they become a force of destruction.

Tornadoes produce the most violent winds on earth, at speeds of 280 mph or more. In addition, tornadoes can travel at a forward speed of up to 70 mph. Damage paths can be in excess of one mile wide and 50 miles long. Violent winds and debris slamming into buildings cause the most structural damage.

The Fujita Scale[2] is the standard scale for rating the severity of a tornado as measured by the damage it causes. A tornado is usually accompanied by thunder, lightning, heavy rain, and a loud "freight train" noise. In comparison with a hurricane, a tornado covers a much smaller area but can be more violent and destructive.

Severe Thunderstorms
All thunderstorms contain lightning. During a lightning discharge, the sudden heating of the air causes it to expand rapidly. After the discharge, the air contracts quickly as it cools back to ambient temperatures. This rapid expansion and contraction of the air causes a shock wave that we hear as thunder, which can damage building walls and break glass.

Lightning
Lightning is a giant spark of electricity that occurs within the atmosphere or between the atmosphere and the ground. As lightning passes through air, it heats the air to a temperature of about 50,000 degrees Fahrenheit, considerably hotter than the surface of the sun. Lightning strikes can cause death, injury and property damage.

Hail
Hailstones are balls of ice that grow as they're held up by winds, known as updrafts, which blow upwards in thunderstorms. The updrafts carry droplets of supercooled water – water at a below freezing temperature – but not yet ice. The supercooled water droplets hit the balls of ice and freeze instantly, making the hailstones grow. The faster the updraft, the bigger the stones can grow. Most hailstones are smaller in diameter than a dime, but stones weighing more than a pound have been recorded. Details of how hailstones grow are complicated, but the results are irregular balls of ice that can be as large as baseballs, sometimes even bigger. While crops are the major victims, hail is also a hazard to vehicles and windows.

Severe Winter Weather

Ice and snow events typically occur during the winter months and can cause loss of life, property damage and tree damage.

Heavy Snow Storms

[2] The Fujita Tornado Scale can be viewed in Appendix D.

A winter storm can range from moderate snow to blizzard conditions. Blizzard conditions are considered blinding wind-driven snow over 35 mph that lasts several days. A severe winter storm deposits four or more inches of snow during a 12-hour period or six inches of snow during a 24-hour period.

Ice Storms

An ice storm involves rain, which freezes upon impact. Ice coating at least one-fourth inch in thickness is heavy enough to damage trees, overhead wires and similar objects. Ice storms also often produce widespread power outages.

Wildfire

Wildfire is defined as an uncontrolled and rapidly spreading fire.

Forest Fires and Grass Fires

A forest fire is an uncontrolled fire in a woody area. They often occur during drought and when woody debris on the forest floor is readily available to fuel the fire. Grass fires are uncontrolled fires in grassy areas.

Earthquakes

Geologic events are often associated with California, but New England is considered a moderate risk earthquake zone. An earthquake is a rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and often cause landslides, flash floods, fires, and avalanches. Larger earthquakes usually begin with slight tremors but rapidly take the form of one or more violent shocks, and end in vibrations of gradually diminishing force called aftershocks. The underground point of origin of an earthquake is called its focus; the point on the surface directly above the focus is the epicenter. The magnitude and intensity of an earthquake is determined by the use of scales such as the Richter scale[3] and Mercalli scale.

Profile of Past and Potential Natural Hazards

As discussed above the natural hazards that affect, or potentially could affect Exeter, New Hampshire, that were identified for designation in this *Plan* include: flooding, hurricanes-high wind events, severe winter weather, wildfire and earthquakes. The hazard profiles below include: a description of the events included as part of the natural hazard, the geographic location of each natural hazard (if applicable), the extent of the natural hazard (e.g. magnitude or severity), probability, past occurrences, and community vulnerability. Past occurrences of natural hazards were mapped if possible (Map 2: Past and Future Hazards). Some of the natural hazards have not occurred within the Town of Exeter (within written memory), for these hazards the *Plan* refers to a table of hazards that have occurred regionally and statewide (Table 3). Community vulnerability identifies the specific areas, general type of structures, specific structures, or general vulnerability of the Town of Exeter to each natural hazard. Probability was defined as high, a roughly 66-100% chance of reoccurrence; medium, roughly a 33-66% chance of reoccurrence; and low, roughly a 0-33% of reoccurrence.

Flooding

[3] A copy of the Richter scale is displayed in Appendix E.

Description: Flooding events can include hurricanes, 100-year floods, debris-impacted infrastructure, erosion, mudslides, rapid snow pack melt, river ice jams, and dam breach and/or failure.
Location: Exeter is vulnerable to flooding in several locations. Generally, the Town is at risk within the Flood Zones identified by FEMA on Flood Insurance Rate Maps (FIRM). As can be seen in Figure 4 in Chapter 2, Exeter has two major flood zones: A and X. These flood zones correspond to the Special Flood Hazard Area (100-year flood zone) and the 500-year flood zone respectively. There are also several areas susceptible to flooding that are not within these flood zones, these areas are listed below and displayed on Map 2: Past and Future Hazards.

- Franklin and River Street neighborhoods
- Court Street (NH Route 108) at the intersection of Bell Avenue and at the Exeter/Kensington town line
- Kingston Road (NH Route 111) at Brickyard Pond to West Side Drive
- Portsmouth Avenue (NH Route 108) abutting the Town of Exeter's Water Treatment Plant, which lies in the 100 year floodplain
- Swasey Parkway is vulnerable to tidal storm surges
- Sewage Treatment Lagoons vulnerable to tidal storm surges
- Powder Mill Road at the railroad crossing the Exeter River
- Lary Lane neighborhood
- Brentwood Road (NH Route 111A) at the intersection of Crestview Drive, east of the intersection of Greenleaf Drive, and west of the intersection with Dogtown Road.
- Pine Road at the Exeter town line

Extent: The extent of the flood zones can be seen in Map 2: Past and Future Hazards. This area includes FIRM Zones A and X, as well as, areas of locally chronic flood problems.

Probability: **High**.

Table 1: Probability of Flooding based on return interval

Flood Return Interval	Chance of Occurrence in Any Given Year
10-year	10%
50-year	2%
100-year	1%
500-year	0.2%

Past Occurrence: Flooding is a common hazard for the Town of Exeter. Several locations were identified by the Committee as areas of chronic reoccurring flooding or high potential for future flooding, as listed above. Larger flood events are listed in Table 3.

Community Vulnerability: Flooding is most likely to occur in the 100-year flood zones. Especially in low lying areas adjacent to the Exeter River, Little River, Dudley Brook and tidal Squamscott River.

There are six dams within or immediately adjacent to Exeter's boundaries, these are:

- Class AA dam at Colcord Pond (Little River off of Brentwood Road (NH Route 111A)
- Class A dam at Pickpocket Road (Exeter River)
- Class A dam at Great Bridge in downtown Exeter (Exeter River)
- Class B dam at the Town of Exeter Sewage Lagoons (Squamscott River) at the Wastewater Treatment Plant off Newfields Road
- Class B Stormwater Holding Pond Lagoons off Jady Hill Avenue (Squamscott River)
- Class C dam at the Water Treatment Plant/Dearborn Brook Reservoir off Portsmouth Avenue

National Flood Insurance Program (NFIP)

In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer funded disaster relief for flood victim and the increasing amount of damage caused by floods. The Federal Insurance and Mitigation Administration (FIMA) a component of the Federal Emergency Management Agency (FEMA) manages the NFIP, and oversees the floodplain management and mapping components of the program.

Communities participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce flood damage. In exchange, the NFIP makes federally subsidized flood insurance available to homeowners, renters, and business owners in these communities. Flood insurance, Federal Grants and loans, Federal disaster assistance and federal mortgage insurance is unavailable for the acquisition or construction of structures located in the floodplain shown on the NFIP maps for those communities that do not participate in the program.

To get secure financing to buy, build or improve structures in the Special Flood Hazard areas, it is legally required by federal law to purchase flood insurance. Lending institutions that are federally regulated or federally insured must determine if the structure is located in the SFHA and must provide written notice requiring flood insurance. Flood insurance is available to any property owner located in a community participating in NFIP.

Flood damage is reduced by nearly $1 billion a year through partnerships with communities, the insurance industry, and the lending industry. Further, buildings constructed in compliance with NFIP building standards suffer approximately 80 percent less damage annually than those not built in compliance. Additionally, every $3 paid in flood insurance claims saves $1 in disaster assistance payments.

The NFIP is self-supporting for the average historical loss year, which means that operating expenses and flood insurance claims are not paid for by the taxpayer, but through premiums collected for flood insurance policies. The program has borrowing authority from the U.S. Treasury for times when losses are heavy; however, these loans are paid back with interest.

Repetitive Loss Properties

A specific target group of repetitive loss properties is identified and serviced separately from other NFIP policies by the Special Direct Facility (SDF). The target group includes every NFIP insured property that, since 1978 and regardless of any change(s) of ownership during that

period, has experienced four or more paid losses, two paid flood losses within a 10-year period that equal or exceed the current value of the insured property, or three or more paid losses that equal or exceed the current value of the insured property, regardless of any changes of ownership, since the buildings construction or back to 1978. Target group policies are afforded coverage, whether new or renewal, only through the SDF.

The FEMA Regional Office provides information about repetitive loss properties to State and local floodplain management officials. The FEMA Regional Office may also offer property owners building inspection and financial incentives for undertaking measures to mitigate future flood losses. These measures include elevating buildings from the flood area, and in some cases drainage improvement projects. If the property owners agree to mitigation measures, their property may be removed from the target list and would no longer be serviced by the SDF.

Table 2: Exeter NFIP Policy and Loss Statistics

Policies in force	Insurance in Force	Number of Paid Losses (since 1978)	Total Losses Paid (Since 1978)
111	$ 20,135,800	70	$1,191,917

Source: FEMA Policy and claims database, as of January, 2012

Exeter NFIP Repetitive Flooding Losses

Exeter joined the Regular Program of the NFIP on May 17, 1982. As of January 2012, Exeter has had 13 repetitive loss residential and 4 non-residential properties according to New Hampshire Office of Energy and Planning (NHOEP) records. This is determined by any repetitive damage claims on those properties that hold flood insurance through the NFIP.

Floodplain Management Goals/Reducing Flood Risks

A major objective to floodplain management is to continue participation in the NFIP. Communities that agree to manage Special Flood hazard Areas shown on NFIP maps participate in the NFIP by adopting minimum standards. The minimum requirements are the adoption of the floodplain Ordinances and Subdivision/Site Plan Review requirements for land designated as Special Flood hazard Areas. Under Federal Law, any structure located in the floodplain is required to have flood insurance. Federally subsidized flood insurance is available to any property owner located in a community participating in the NFIP. Communities that fail to comply with the NFIP will be put on probation and/or suspended. Probation is a first warning where all policy holders receive a letter notifying them of a $50 increase in their insurance. In the event of suspension, the policyholders lose their NFIP insurance and are left to purchase insurance in the private sector, which is of significantly higher cost. If a community is having difficulty complying with NFIP policies, FEMA is available to meet with staff and volunteers to work through the difficulties and clear up any confusion before placing the community on probation or suspension.

Potential Administrative Techniques to Minimize Flood Losses in Exeter

A potential step in mitigating flood damage is participating in NFIP. Exeter continues to consistently enforce NFIP compliant policies in order to continue its participation in this program and has effectively worked within the provisions of NFIP. Below is a list of actions Exeter should consider, or continue to perform, in order to comply with NFIP:

- Participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management;
- Establish Mutual Aid Agreements with neighboring communities to address administering the NFIP following a major storm event;
- Address NFIP monitoring and compliance activities;
- Revise/adopt subdivision regulations, erosion control regulations, board of health regulations to improve floodplain management in the community;
- Prepare, distribute or make available NFIP insurance and building codes explanatory pamphlets or booklets;
- Identify and become knowledgeable of non-compliant structures in the community;
- Inspect foundations at time of completion before framing to determine if lowest floor is at or above Base Flood Elevation (BFE), if they are in the floodplain;
- Require the use of elevation certificates;
- Enhance local officials, builders, developers, local citizens and other stakeholders' knowledge of how to read and interpret the FIRM;
- Work with elected officials, the state and FEMA to correct existing compliance issues and prevent any future NFIP compliance issues through continuous communications, training and education.

Hurricanes-High Wind Events

Description: High wind events can include hurricanes, tornadoes, "Nor'-Easters," downbursts and lightning/thunderstorm events.

Location: Hurricane events are more potentially damaging with increasing proximity to the coast. Exeter's immediate proximity to the Atlantic Coast makes hurricanes and high wind events severe threats. For this *Plan*, high-wind events were considered to have an equal chance of affecting any part of the Town of Exeter, however the following areas are highlighted on the Past and Future Hazard Map that typically are impacted by high wind events.

- Pick Pocket Road including Pick Pocket Ridge

Extent: Exeter is located within Zone II hurricane-susceptible region (indicating a design wind speed of 160 mph)[4]. From 1950 to 1995 Rockingham County was subject to 9 tornado events, these included 2 type F0 (Gale Tornado, 40-72 mph), 2 type F1 (Moderate Tornado, 73-112 mph), 4 type F2 (Significant Tornado, 113-157 mph) and 1 type F3 (Severe Tornado, 158-206 mph)[5]. Type 3 tornados can cause severe damage including tearing the roofs and walls from well-constructed homes, trees can be uprooted, trains over-turned, and cars lifted off the ground and thrown[6]. Between 1900 and 1996 2 hurricanes have made landfall in New Hampshire, a category 1 and a category 2. In Maine, 5 hurricanes have made landfall (all category 1). In Massachusetts, 6 hurricanes have made landfall (2 category 1, 2 category 2 and 2 category 3). From this information it

[4] "Understanding Your Risks, Identifying Hazards and Estimating Losses", FEMA
[5] The tornado project .com
[6] "Understanding Your Risks, Identifying Hazards and Estimating Losses", FEMA

can be extrapolated that Exeter is a high risk to a hurricane event, with wind speeds variable between 74 – 130 mph (category 1-3).

Probability: **High**. The State of New Hampshire's Natural Hazards Mitigation Plan rates Rockingham County with high likelihood of hurricane, tornado and "Nor'-Easters" events. Also, it rates the risk of downbursts, lightning and hail events as moderate.

Past Occurrence:
Between 1635 and 1991, 10 hurricanes have impacted the State of New Hampshire. The worst of these occurred on September 21, 1938, with wind speeds of up to 186 mph in MA and 138mph elsewhere. Thirteen of 494 people killed by this storm were residents of New Hampshire. The Storm caused $12,337,643 in damages (1938 dollars), timber not included.
Rockingham tornado history is as follows: Category F0 tornados occurred on Oct. 03, 1970 and June 09, 1978. Category F1 tornados occurred on July 31, 1954 and July 26, 1966. Category F2 tornados occurred on Aug. 21, 1951, June 19, 1957, July 02, 1961 and June 09, 1963. The category F3 tornado occurred on June 09, 1953.

Community Vulnerability:
- Power lines,
- Shingled roofs,
- Chimneys, and
- Trees

Severe Winter Weather

Description: There are three types of winter events: blizzards, ice storms and extreme cold. All of these events are a threat to the community with subzero temperatures from extreme wind chill and storms causing low visibility for commuters. Snow storms are known to collapse buildings. Ice storms disrupt power and communication services. Extreme cold affects the elderly. None of these storms affect one area of town more than another.

Location: Severe winter weather events have and equal chance of affecting any part of the Town of Exeter.

Extent: Large snow events in Southeastern New Hampshire can produce 30 inches of snow. Portions of central New Hampshire recorded snowfalls of 98" during one slow moving storm February of 1969. Ice storms occur with regularity in New England. Seven severe ice storms have been recorded that affected New Hampshire since 1929. These events caused disruption of transportation, loss of power and millions of dollars in damage.

Probability: **High**. The State of New Hampshire's Natural Hazards Mitigation Plan rates Rockingham County with high likelihood of heavy snows and ice storms.

Past Occurrence: A list of past winter storm events is displayed below, in Table 3.

Community Vulnerability:
- Power lines,

- Trees, and
- Elderly Populations

Wildfires

Description: Wildfires include grass fires, forest fires and issues with isolated homes and residential areas.

Location: The Committee identified the following areas of Town at-risk to wildfires, which are also located on Map 2 Past and Future Hazards.

- The Oakland's Town Forest
- Marsh lands abutting the Squamscott
- Area near railroad on the marsh

Extent: A wildfire in the Town of Exeter is unlikely, but if a crown fire were to occur it could be very damaging to several small sections of Town, such as the Town Forest.

Probability: **Moderate**. The State of New Hampshire's Natural Hazards Mitigation Plan rates Rockingham County with moderate risk to wildfires.

Past Occurrence: The majority of wildfires in Exeter are minor brush fires. No Large fires have occurred within recent memory.

Community Vulnerability:

- Structures located near large open vegetated areas prone to lightning strike

Earthquakes

Description: including landslides and other geologic hazards related to seismic activity.

Location: An earthquake has an equal chance of affecting all areas in the Town of Exeter.

Extent: New England is particularly vulnerable to the injury of its inhabitants and structural damage because of our built environment. Few New England States currently include seismic design in their building codes. Massachusetts introduced earthquake design requirements into their building code in 1975 and Connecticut very recently did so. However, these specifications are for new buildings, or very significantly modified existing buildings only. Existing buildings, bridges, water supply lines, electrical power lines and facilities, etc. have rarely been designed for earthquake forces (New Hampshire has no such code specifications).

Probability: **Moderate**. The State of New Hampshire's Natural Hazard Mitigation Plan ranks all of the Counties in the State with at moderate risk to earthquakes. The Town of Exeter's Peak Ground Acceleration (PGA) values range between 6.1 and 21.0[7]. These numbers are associated with how much an earthquake is felt and how much damage it may cause (Table 2).

[7] http://geohazards.cr.usgs.gov/eq/pubmaps/us.pga.050.map.gif

Table 3: Peak Ground Acceleration (PGA) Values for Exeter (information from State and Local Mitigation Planning, FEMA).

PGA	Chance of being exceeded in the next 50 years	Perceived Shaking	Potential Damage
6.1	10%	Moderate	Very Light
10.6	5%	Strong	Light
21.0	2%	Very Strong	Moderate

Past Occurrence: Large earthquakes have not affected the Town of Exeter within recent memory. A list of earthquakes that have affected the region is displayed in Table 3.

Community Vulnerability:

- Dams,
- Bridges,
- Brick Structures,
- Infrastructure,
- Water and Gas lines, and
- Secondary hazards such as fire, power outages, or hazardous material leak or spill.

Table 4: Past Hazard Events in Exeter and Rockingham County

Hazard	Date	Location	Critical Facility or Area Impacted	Remarks/Description
Flood	March 11-21, 1936	Statewide	$133,000,000 in damage throughout New England, 77,000 homeless.	Double Flood; snowmelt/heavy rain.
Flood	September 21, 1938	Statewide	Unknown	Hurricane; stream stage similar to March 1936
Flood	July 1986 – August 10, 1986	Statewide	Unknown	**FEMA DR-771-NH**: Severe storms; heavy rain, tornadoes , flash flood, severe wind
Flood	August 7-11 1990	Statewide	Road Network	**FEMA DR-876-NH**: A series of storms with moderate to heavy rains; widespread flooding.
Flood	August 19, 1991	Statewide, Primarily Rockingham and Strafford Counties	Road Network	**FEMA DR-917-NH:** Hurricane Bob; effects felt statewide; counties to east hardest hit.
Flood	October 28, 1996	Rockingham County	Unknown - Typically structures and infrastructure in the floodplain	North and west regions; severe storms.
Flood	June – July 1998	Rockingham County	Heavy damage to secondary roads occurred	**FEMA DR-1231-NH:** A series of rainfall events
Flood	May 12, 2006	Central and Southern Regions	100 yr – 500 yr	**FEMA-1643-DR:** Severe storms and flooding. Counties Declared: Belknap, Carroll, Grafton, Hillsborough, Merrimack, Rockingham, and Strafford
Flood	April 15 - 23, 2007	Statewide	100 yr – 500 yr	**FEMA-1695-DR:** Severe storms and flooding associated with a Nor'easter. Counties Declared: Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan.
Flood	July 24 2008	Central and Southern Regions	100 yr – 500 yr	**FEMA-1782-DR** Severe storms, tornado and flooding. Counties Declared: Belknap, Carroll, Merrimack, Rockingham, and Strafford

Hazard	Date	Location	Critical Facility or Area Impacted	Remarks/Description
Flood	March 14 – 31, 2010	Southeastern Region	100 yr – 500 yr	**FEMA-1913-DR** Severe storms and flooding. Counties Declared: Hillsborough and Rockingham County
Flood	May 26-30, 2011	Coos amd Grafton County	Unknown	**FEMA-4006-DR**
Flood	May 29-31, 2012	Cheshire County	Unknown	**FEMA-4065-DR**
Hurricane	October 18,19 1778	Portions of State	Unknown	40-75 mph winds
Hurricane	1804	Portions of State	Unknown	
Hurricane	September 8, 1869	Portions of State	Unknown	> 50 mph winds
Great Hurricane Of 1938	September 21, 1938	All of Southern New England	2 billion board feet of timber destroyed; electric and telephone disrupted, structures damaged, flooding; statewide 1,363 families received assistance.	Max. wind speed of 186 mph in MA and 138mph max. elsewhere 13 of 494 dead in NH; $12,337,643 total storm losses (1938 dollars), timber not included.
Hurricane Carol	August 31, 1954	Southern New England	Extensive tree and crop damage in state.	SAFFIR/SIMPSON HURRICANE SCALE[8] - Category 3, winds 111-130 mph
Hurricane Donna	September 12, 1960	Southern and Central NH	Unknown	Category 3 Heavy Flooding
Hurricane Belle	August 10, 1976	Southern New England	Unknown	Category 1, winds 74-95 mph Rain and flooding in NH
Hurricane Gloria	September 27, 1985	Southern New England	Unknown	Category 2, winds 96-110 mph >70 mph winds; minor wind damage and
Tropical Storm Floyd	September 16-18 1999	Statewide	Unknown	
Tropical Storm Irene	August 26-Septmeber 6	Carroll, Coos, Grafton, Merrimack, Belknap, Strafford, Sullivan, Hillsborough and Rockingham Counties	Extensive Flooding and power outages due to downed trees	FEMA- 4026-DR Emergency declaration from Tropical Strom Irene for Hillsborough and Rockingham Counties
Ice Jam	Feb 29, 2000	Brentwood, NH Exeter River	Unknown	Discharge 570 cfs
Ice Jam	Mar 29, 1993	Epping, NH Lamprey River	Road flooding	
Tornado	May 21, 1814	Rockingham County	Unknown	F2[9]

[8] For a complete description of the Saffir/Simpson Hurricane Scale see Appendix C.
[9] For a complete description of the Fujita Tornado Damage Scale see Appendix D

Hazard	Date	Location	Critical Facility or Area Impacted	Remarks/Description
Tornado	May 16, 1890	Rockingham County	Unknown	F2
Tornado	August 21, 1951	Rockingham County	Unknown	F2
Tornado	June 9, 1953	Rockingham County	Unknown	F3
Tornado	June 19, 1957	Rockingham County	Unknown	F2
Tornado	July 2, 1961	Rockingham County	Unknown	F2
Tornado	June 9, 1963	Rockingham County	Unknown	F2
Downburst	July 6, 1999	Stratham, NH	Five fatalities and eleven injuries. Major tree damage, power outages	Microburst $2,498,974 in damages
Tornado	May 21, 2006	Rockingham County	Unknown	F2
Tornado	July 24, 2008	Rockingham, Merrimack, Belknap, Strafford, Carrol	Unknown	F2
Ice Storm	December 17-20 1929	NH	Telephone, telegraph and power disrupted.	
Ice Storm	December 29-30 1942	NH	Unknown- Typically damage to overhead wires and trees.	Glaze storm; severe intensity
Ice Storm	December 22 1969	Parts of NH	Power disruption	Many communities affected
Ice Storm	January 17, 1970	Parts of NH	Power disruption	Many communities affected
Ice Storm	January 8-25 1979	NH	Major disruption of Power and transportation	
Ice Storm	March 3-6 1991	Southern NH	Numerous power outages in southern NH	Numerous in Southern NH
Ice Storm	January 7, 1998	Rockingham County	Power and phone disrupted, communication tower collapsed.	$17,000,000 in damages to PSNH equipment.
Ice Storm	December 12, 2008	New England,	Severe ice storm that caused major damage to private and public utilities.	PSNH states cost of restoration effort Estimated at $75 million for NH alone
Snowstorm	February 4-7 1920	New England	Disrupt transportation for weeks	Boston 37-50cm of sleet , ice and snow
Snowstorm	February 15, 1940	New England	Paralyzed New England	30cm of snow with high wind.

Hazard	Date	Location	Critical Facility or Area Impacted	Remarks/Description
Snowstorm	February 14-17 1958	Southern NH	Unknown	20-33" of snow
Snowstorm	March 18-21 1958	South central NH	Unknown	22-24"of snow
Snowstorm	March 2-5 1950	Southern NH	Unknown	25"of snow
Snowstorm	January 18-20 1961	Southern NH	Unknown	Blizzard Conditions; 50cm of snow
Snowstorm	February 8-10 1969	Southeastern NH	Paralyzing snow	27"of snow and high winds
Snowstorm	February 22-28 1969	Central NH	Unknown	34-98"of snow; very slow moving
Snowstorm "Blizzard of'78"	February 5-7 1978	Statewide	Trapped commuters on highways, businesses closed	Hurricane force winds; 25-33"of snow. People disregard warnings due to a series of missed forecasts
Snowstorm	April 5-7 1982	Southern NH	Unknown	Late season with thunderstorms and 18-22" of snow
Snow Emergency	March 2001	Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, and Strafford	Unknown	FEMA-3166-EM $4,500,000
Snow Emergency	March 11, 2003	Cheshire, Hillsborough, Merrimack, Rockingham and Strafford	Unknown	FEMA-3177-EM $3,000,000
Snow Emergency	March 30, 2005	Belknap, Carroll, Cheshire, Grafton, Hillsboro, Merrimack, Rockingham, Strafford and Sullivan	Unknown	FEMA-3207-EM $4,654,738
Snow Emergency	April 28, 2005	Carroll, Cheshire, Hillsboro, Rockingham and Sullivan	Unknown	FEMA-3211-EM $2,677,536
Severe Winter Storm	December 11, 2008	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan	Unknown	FEMA-1812-DR $19,789,657
Severe Winter Storm	February 23, 2010	Merrimack, Rockingham, Strafford, and Sullivan	Unknown	FEMA-1892-DR
Severe Winter Storm	March 14, 2010	Rockingham and Hillsborough Counties	Unknown	FEMA-1913-DR
Sever Winter Storm	October 29-30, 2011	Rockingham and Hillsborough Counties	Uknown	FEMA-4049-DR
Earthquake	November 18, 1929	Grand Banks Newfoundland	No damage	Richter Magnitude Scale: 7.2[10]

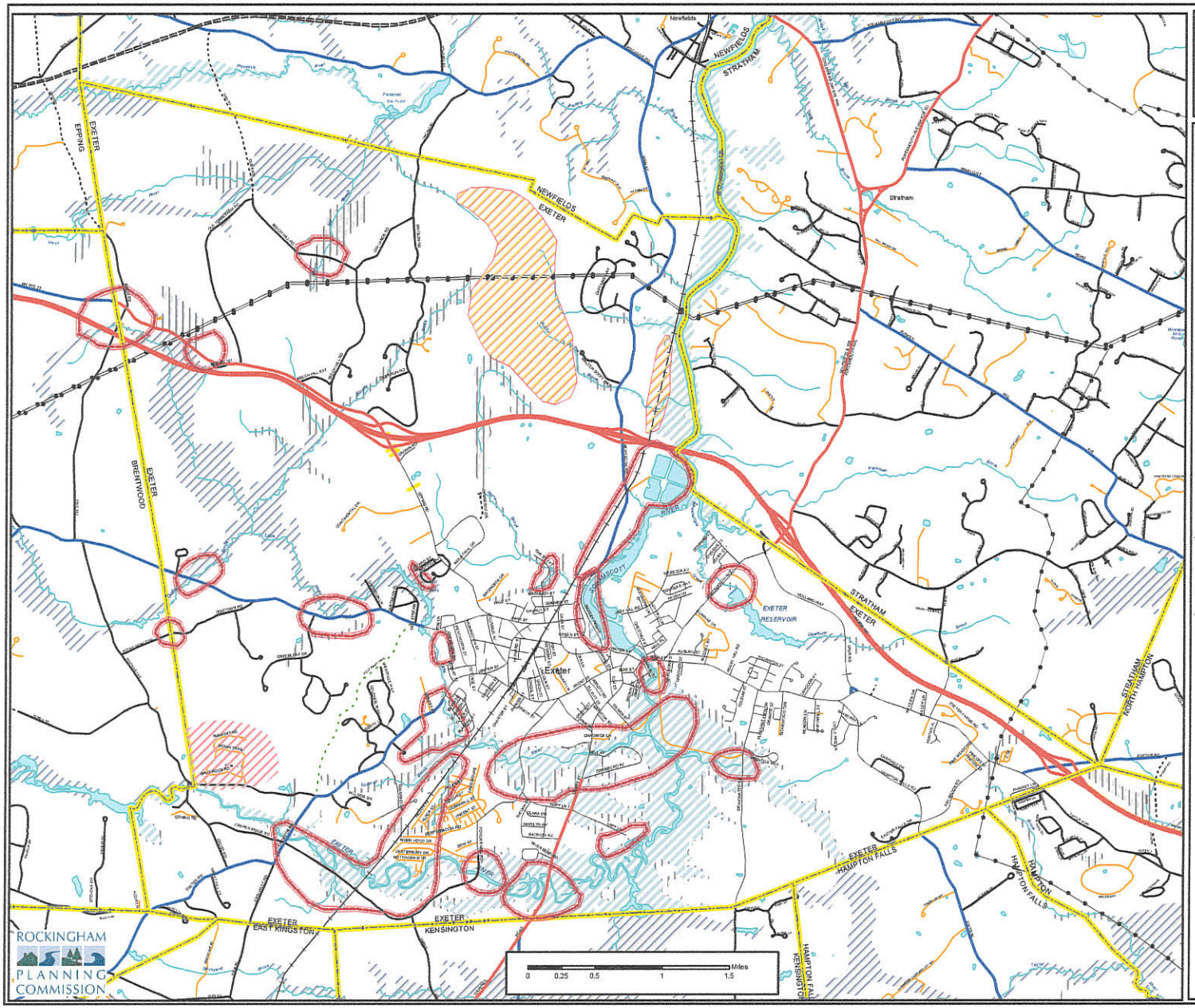
[10] For a complete description of the Richter Magnitude Scale see Appendix E.

Hazard	Date	Location	Critical Facility or Area Impacted	Remarks/Description
Earthquake	December 20, 1940	Ossipee	Ground Cracks and damage over a broad area	Richter Magnitude Scale: 5.5; Felt over 341 miles away.
Earthquake	December 24, 1940	Ossipee	Ground Cracks and damage over a broad area	Richter Magnitude Scale: 5.5; Felt over 550 KM away.
Earthquake	June 15, 1973	Quebec/NH border	Minor damage	Richter Magnitude Scale: 4.8
Earthquake	June 19, 1982	West of Laconia	Little damage	Richter Magnitude Scale: 4.5
Drought	1929-36	Statewide	Unknown	Regional
Drought	1939-44	Statewide	Unknown	Severe in southeast NH
Drought	1947-50	Statewide	Unknown	Moderate
Drought	1960-69	Statewide	Unknown	Longest recorded continuous period of below normal precipitation
Drought Warning	June 6, 1999	Most of State	Unknown	Governors office declaration; Palmer Drought Survey Index indicate "moderate drought" for most of state.
Drought	2001-2002	Statewide	Unknown	Third worst drought on record, exceeded only by the drought of 1956-1966 and 1941-1942

Sources: New Hampshire Homeland Security and Emergency Management, 2010; Town of Exeter; Northeast States Emergency Consortium (NESEC) Website: http://www.nesec.org;

United States Geological Survey's (USGS) Earthquake Hazards Program
http://earthquake.usgs.gov/earthquakes/eqarchives/last_event/states/

Ice Engineering Research Group Cold Regions Research and Engineering Laboratory (CRREL)
https://rsgis.crrel.usace.army.mil/apex/f?p=273:2:6994523042511727



Past and Future Hazards Map
Exeter, New Hampshire

March 2012

DRAFT 2011-2012 UPDATE

Legend

- Fire
- Wind
- Flood

Flood Zones

- A — *Area inundated by 1% annual chance flooding, for which no base flood elevations(BFEs) have been determined*
- AE — *Area inundated by 1% annual chance flooding, for which base flood elevations have been determined*
- X500 — *Area inundated by 0.2% annual chance flooding; an area inundated by 1% annual chance flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; or an area protected by levees from 1% annual chance flooding.*

BASE FEATURES

Roads
- State Primary System
- State Secondary System
- Local Roads (Municipal or Private)
- Unmaintained Roads (Class VI)
- Trail

Railroads
- Railroads
- Abandoned Railroads
- Major Powerlines
- Major Pipelines
- Town Boundary

Surface Water Features
- Stream, Shoreline
- Intermittent Stream
- Apparent Wetland Limit
- Other Water Feature
- Bodies of Water

Past and future hazards were identified by the Hazard Mitigation Planning Committee from the Town of Exeter. Information was gathered to accompany the development of a Hazard Mitigation Plan under the guidance and funding of the NH Office of Emergency Management. February, 2003.

FEMA Q3 Flood Data was created from the Federal Emergency Management Agency, National Flood Insurance Program, Q3 Flood Data DISC 23 (Maine, New Hampshire, Vermont). ARC/INFO Export files were retrieved from the CD cited above, imported into ARC/INFO, projected (from geographic coordinates, NAD27 to NH State Plane feet, NAD83), processed to reconstruct topology, and written back out as Export files. Any documentation files for the data can be had from RPC, and do not reflect the processing noted above and performed by Complex Systems Research Center, UNH, December, 1997.

Base data (town boundaries, hydrography, roads, railroads and utility lines) are taken from the USGS Digital Line Graph data, 1:24,000, as archived in the GRANIT database at Complex Systems Research Center, Institute for thestudy of Earth, Oceans and Space, University of New Hampshire, Durham, NH, 1992-1999. Roads have been updated from work done by Rockingham Planning Commission and NH Department of Transportation Partial updates have been completed through 2000.

Path: O:\d-multiyear\d-NHOEM\d-towns\d-Exeter_upd2011\d-maps\Map7Exeter_PastandFutureNatHazardsv2.mxd

CHAPTER IV. CRITICAL FACILITIES

The Critical Facilities List for the Town of Exeter has been identified by Exeter's Hazard Mitigation Committee. The Critical Facilities List has been broken up into four categories. The *first category* contains facilities needed for Emergency Response in the event of a disaster. The *second category* contains Non-Emergency Response Facilities that have been identified by the committee as non-essential. These are not required in an emergency response event, but are considered essential for the everyday operation of Exeter. The *third category* contains Facilities/Populations that the committee wishes to protect in the event of a disaster. The *fourth category* contains Potential Resources, which can provide services or supplies in the event of a disaster. Map 3: Critical Facilities at the end of this Chapter identifies the location of the facilities and the evacuation routes. A detailed description of critical facilities can be found in Table 4 through Table 7.

Table 5: Category 1 - Emergency Response Services and Facilities:

Red	Critical Facility Name		
1	Cell Tower	Guinea Rd	Back-up Power
2	Cell Tower	Watson Rd	Back-up Power
3	Cell Tower	Commerce Way	Back-up Power
4	Cell Tower	115 Epping Rd	Back-up Power
5	Electric Substation	River Street	
6	Exeter Hospital	10 Buzzell Ave	Back-up Power, Helipad
7	Exeter Safty Complex	20 Court St	Primary EOC, backup power, fuel
8	Exeter Town Offices	10 Front St	Back-up Power
9	Exeter Fire Station	20 Court St	
10	Exeter Police Station	20 Court St	
11	Exeter Public Works	13 Newfields Rd	Fuel
12	Wastewater Treatment Plant	Portsmouth Ave	Back-up Power
13	Water Supply Intake	Access of Gilman Lane	
14	Water Supply Reservoir	Portsmouth Ave	Within 100 yr floodplain
15	Water Supply Well	Lary Lane	Backup-power
16	Water Treatment Plant	Portsmouth Ave	Backup-power, within 100 yr floodplain

Table 6: Category 2 - Non Emergency Response Facilities:

The town has identified these facilities as non-emergency facilities; however, they are considered essential for the everyday operation of Exeter.

Yellow	Critical Facility Name		
1	Sewer Pump Station	Colcord Pond Drive	no generator
2	Sewer Pump Station	Court St	
3	Sewer Pump Station	Folsom way	no generator
4	Sewer Pump Station	Front Street	Backup-power
5	Water Pump Station	Kingston Road	
6	Sewer Pump Station	Langdon Ave	
7	Sewer Pump Station	Main Street	
8	PEA Power Station	Marston St	Power Station/Substn
9	Power Substation	Portsmouth Ave	Power Station/Substn
10	Exeter Public Works	13 Newfields Rd	Sewage Facility
11	Water Pump Station	Exeter River	
12	Sewer Pump Station	Riverbend Circle	no generator
13	Sewer Pump Station	Riverwoods Drive	
14	Telephone Building	Center St	Telephone
15	Water Tower	Cross Rd	Water Facility
16	Water Tower	Fuller Ln	Water Facility
17	Water Tower	89 Epping Rd	Water Facility
18	Water Treatment Plant	Portsmouth Ave	Water Facility
19	Sewer Pump Station	Webster Ave	

Table 7: Category 3 - Facilities/Populations to Protect:

The third category contains people and facilities that need to be protected in event of a disaster.

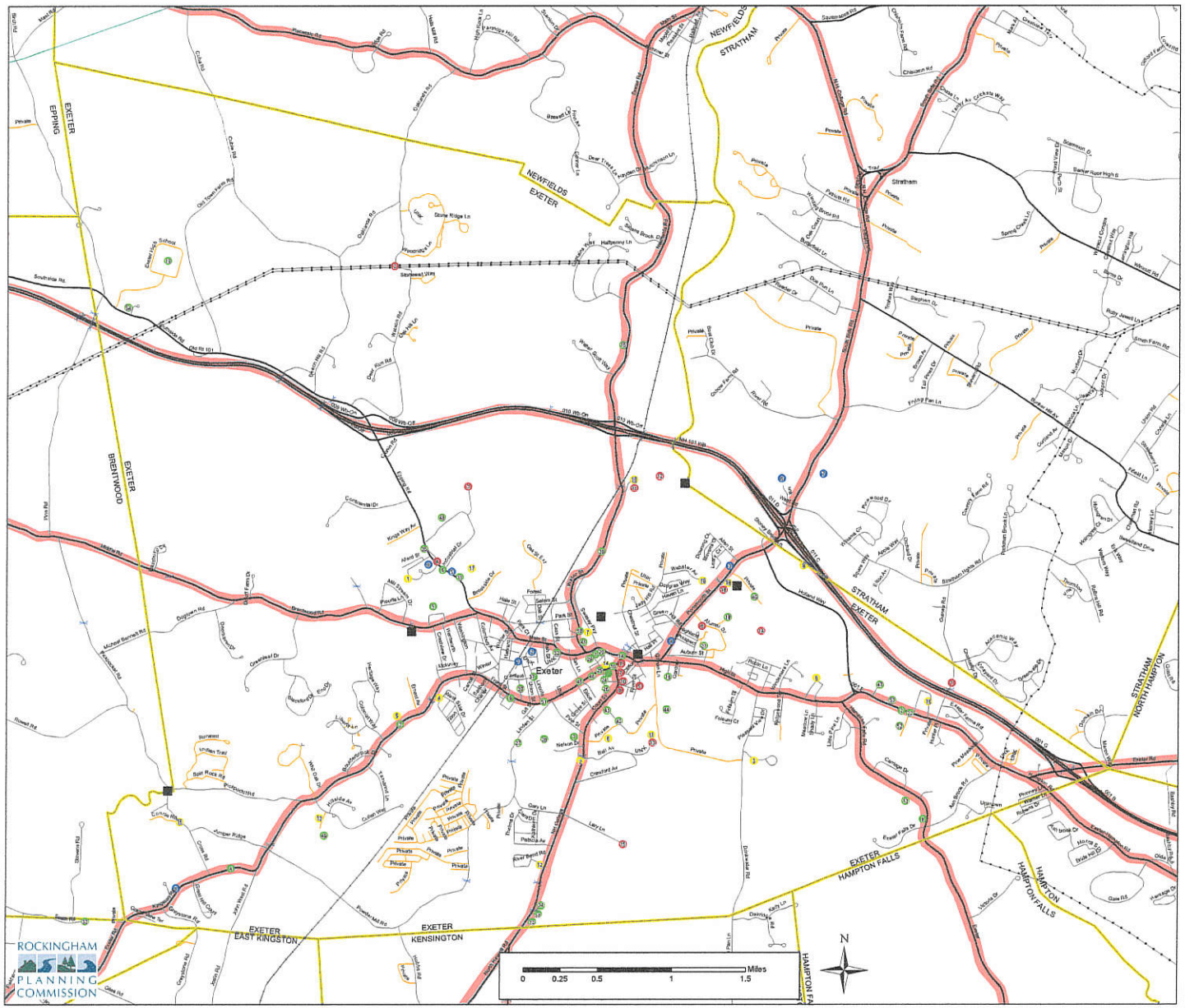
Green	Critical Facility Name	ADDRESS	Comments
1	American Independence Museum	see map	Historic building
2	Appleseeds Day School	Hampton Rd	Day Care
3	Brickyard Pond Fields	Kingston Rd	Recreation - Outdoor
4	Building Blocks School	125 Kingston Rd	Day Care
5	Calvary Baptist Church	12 Little River Rd	Religious Facility
6	Calvary Chapel Seacoast	104 Epping Rd	Religious Facility
7	Christs Church Episcopal	43 Pine St	Religious Facility
8	Church of Jesus Christ of Lds	55 Hampton Falls Rd	Religious Facility
9	Community Church at Exeter	134 Front St	Religious Facility
10	Congregational Church	21 Front St	Religious Facility
11	Decolores Children's Center	87 Epping Rd	Day Care
12	Elms Campground	see map	Campground
13	Exeter Assembly of God	47A Hampton Falls Rd	Religious Facility
14	Exeter Bandstand	see map	Historic structure
15	Exeter Christian Fellowship	50 Newfields Rd	Religious Facility
16	Exeter Day School	11 Marlboro St	School
17	Exeter Elms	188 Court St	Recreation - Outdoor
18	Exeter Health Care	4 Alumni Dr	Nursing Home
19	Exeter High School	30 Linden St	School
20	Exeter Historical Society	see map	Historic building
21	Exeter Hospital	10 Buzell Ave	Medical Facility
22	Exeter On Hampton	see map	
23	Exeter Presbyterian Church	29 Front St	Religious Facility
24	Faith Lutheran Church	4 Elm St	Religious Facility
25	First Baptist Church of Exeter	2 Spring St	Religious Facility
26	First Unitarian Society of Exeter	12 Elm St	Religious Facility
27	Former Exeter High School Annex	Linden St	Staging Area
28	Former Exeter HS Fields	see map	Staging Area

Green	Critical Facility Name	ADDRESS	Comments
29	Gilmore Garrison House	see map	Historic Building
30	Great Bay Kids Company	13 School St	Day Care
31	Great Bay Kids Company	25 Lincoln St	Day Care
32	Great Bay Kids Company	40 Main St	Day Care
33	Great Hill Childcare	14 South Rd	Day Care
34	Green Gate Campground	185 Court St	Recreation - Outdoor
35	Hartman Oil Company	see map	Hazardous waste
37	Lincoln St School	25 Lincoln St	School
38	Main Street School	40 Main St	School
39	Montessori School of Exeter	2 Newfields Rd	School
40	OSRAM Sylvania	131 Portsmouth Ave	Manufacturing facility/hazardous material
41	PEA Daycare	see map	Day Care
42	PEA Fields	Gilman St	Staging Area
43	PEA Love Gym	Gilman St	Emergency Shelter
44	PEA Stadium	see map	Recreation - Outdoor
45	Phillips Church	Tan Ln	Religious Facility
46	Phillips Exeter Academy	20 Main St	School
47	Recreation Fields	Hampton Rd	Recreation Outside
48	Rinks at Exeter	40 Industrial Dr	Emergency Shelter
49	Riverwoods	Riverwoods Dr	Elderly
50	Squamscott View	277 Water St	Elderly
51	St Michaels Catholic Church	9 Lincoln St	Religious Facility
52	Sunbridge Langdon Place	17 Hampton Rd	Elderly
53	Sunbridge Langdon Place	8 Hampton Rd	Nursing Home
54	United Methodist Church	307 Epping Rd	Religious Facility

Table 8: Category 4 - Potential Resources:

This category contains facilities that provide potential resources for services or supplies in the event of a natural disaster.

Blue	Critical Facility Name		
1	AMTRAK Rail Station	Lincoln Street	Transportation
2	Arjay's Hardware	Lincoln Street	Building Supplies
3	Exeter Lumber	120 Portsmouth Ave	Building Supplies
4	Exeter Rental	Portsmouth Ave	Machinery/supplies
5	First Student Transportation	Epping Road	Transportation
6	Market Basket Supermarket	Portsmouth Ave, Stratham, NH	Food and water
7	Shaws Supermarket	Portsmouth Ave, Stratham, NH	Food and water
8	Simpson Gravel Pit	Kingston Road	Sand and gravel
9	Stop & Shop Supermarket	Portsmouth Ave	Food and water



Critical Facilities
Exeter, New Hampshire

March 2012

DRAFT

- Emergency Response Services
- Potential Resources
- Non Emergency Response Facilities
- Facilities/Populations to Protect

Blue	Potential Resources	Green	Facilities/Populations to Protect
1	AMTRAK Rail Station	1	American Independence Museum
2	Anjo's Hardware	2	Applewoods Day School
3	Exeter Lumber	3	Brickyard Pond Fields
4	Exeter Rental	4	Building Blocks School
5	First Student Transportation	5	Calvary Baptist Church
6	Market Basket Supermarket	6	Calvary Chapel Seacoast
7	Shaws Supermarket	7	Christa Church Episcopal
8	Simpson Gravel Pit	8	Church of Jesus Christ of Ldy
9	Stop & Shop Supermarket	9	Community Church at Exeter
		10	Congregational Church
		11	Decoiores Childrens Center
Red	Emergency Response Services	12	Elm Campground
1	Cell Tower	13	Exeter Assembly of God
2	Cell Tower	14	Exeter Bandstand
3	Cell Tower	15	Exeter Christian Fellowship
4	Cell Tower	16	Exeter Day School
5	Electric Substation	17	Exeter Elms
6	Exeter Hospital	18	Exeter Health Care
7	Exeter Safty Complex	19	Exeter High School
8	Exeter Town Offices	20	Exeter Historical Society
9	Exeter Fire Station	21	Exeter Hospital
10	Exeter Police Station	22	Exeter On Hampton
11	Exeter Public Works	23	Exeter Presbytetrain Church
12	Wastewater Treatment Plant	24	Faith Lutherian Church
13	Water Supply Intake	25	First Baptist Church of Exeter
14	Water Supply Reservoir	26	First Unitarian Society of Exeter
15	Water Supply Well	27	Former Exeter High School Annex
16	Water Treatment Plant	28	Former Exeter HS Fields
		29	Gilmore Garrison House
		30	Great Bay Kids Company
		31	Great Bay Kids Company
Yellow	Non Emergency Response Facilities	32	Great Bay Kids Company
1	Sewer Pump Station	33	Great Hill Childcare
2	Sewer Pump Station	34	Green Gate Campground
3	Sewer Pump Station	35	Harriman Oil Company
4	Sewer Pump Station	37	Lincoln St School
5	Water Pump Station	38	Main Street School
6	Sewer Pump Station	39	Montessori School of Exeter
7	Sewer Pump Station	40	OSRAM Sylvania
8	PEA Power Station	41	PEA Bandarn
9	Power Substation	42	PEA Fields
10	Exeter Public Works	43	PEA Love Gym
11	Water Pump Station	44	PEA Stadium
12	Sewer Pump Station	45	Phillips Church
13	Sewer Pump Station	46	Phillips Exeter Academy
14	Telephone Building	47	Recreation Fields
15	Water Tower	48	Rinks at Exeter
16	Water Tower	49	Riverwoods
17	Water Tower	50	Squamscott View
18	Water Treatment Plant	51	St Michales Catholic Church
19	Sewer Pump Station	52	Sunbridge Langdon Place
		53	Sunbridge Langdon Place
		54	United Methodist Church

Dams
Bridges
Evacuation Routes

BASE FEATURES

Roads
- State Primary System
- State Secondary System
- Local Roads (Municipal or Private)
- Unmaintained Roads (Class VI)
- Trail
- Railroads
- Abandoned Railroads
- Major Powerlines
- Major Pipelines
- Town Boundary

Surface Water Features
- Stream, Shoreline
- Intermittent Stream
- Apparent Wetland Limit
- Other Water Feature
- Bodies of Water

Critical facilities, dams, bridges and evacuation routes were provided by the town of Exeter, with assistance from NHDOT for bridges and the NHDES for dams. Information was gathered to accompany the development of a Hazard Mitigation Plan under the guidance and funding of the NH Office of Emergency Management. March 2012.

Base data (town boundaries, hydrography, roads, railroads and utility lines) are taken from the USGS Digital Line Graph data, 1:24,000, as archived in the GRANIT database at Complex Systems Research Center, Institute for the study of Earth, Oceans and Space, University of New Hampshire, Durham, NH; 1992-1999. Roads have been updated from work done by Rockingham Planning Commission and NH Department of Transportation. Partial updates have been completed through 2010.

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CHAPTER V. DETERMINING HOW MUCH WILL BE AFFECTED

Identifying Vulnerable Facilities

It is important to determine which critical facilities are the most vulnerable and to estimate their potential loss. The first step is to identify the facilities most likely to be damaged in a hazard event. To do this, the location of critical facilities illustrated on Map 3 was compared to the location of various topographical elements, floodplains, roads, and water bodies using GIS (Geographic Information Systems). Vulnerable facilities were identified by comparing their location to possible hazard events. For example, all of the structures within the 100-year and 500-year floodplains were identified and used in conducting the potential loss analysis for flooding.

Calculating the Potential Loss

The next step in completing the loss estimation involved assessing the level of damage from a hazard event as a percentage of the facility's structural value. The Federal Emergency Management Agency (FEMA) has developed a process in which replacement values for structures located in the 100 and 500-year floodplains can be calculated according to the amount of damage suffered[11]. In Exeter, the assessed values were determined for every structure identified in the floodplain based on 2006 values. The potential loss was then calculated by multiplying the assessed value of the structure by the percent of damage expected from a hazard event (i.e., 100-year, 4-foot flood, etc.). The following discussion summarizes the potential loss estimates to structures (residential and non-residential) due to natural hazard events.

Flooding

Flooding is often associated with hurricanes, ice jams, rapid snow melt in the spring and heavy rains. Founded along the banks of the Squamscott and Exeter Rivers in 1638, it is not surprising that the natural hazard that poses the greatest threat to Exeter is riverine flooding.

The average replacement value was calculated by adding up the assessed values of all structures in the 100 and 500 year floodplains. Again, because not much development has occurred in these areas over the last 5 years, both the number of structures and assessed values were identified in 2006 using 2006 information by overlaying digital versions of FEMA's FIRM maps on digital aerial photography of the town of Exeter. Because of the scale and resolution of the FIRM maps and imagery this is only an approximation of the total structures located within the 100 and 500 year floodplains. The Federal Emergency Management Agency (FEMA) has developed a process to calculate potential loss for structures during flood. The potential loss was calculated by multiplying the replacement value by the percent of damage expected from the hazard event. Residential and non-residential structures were combined. The costs for repairing or replacing bridges, railroads, power lines, telephone lines, and contents of structures are not included in this estimate. In addition, the figures used were based on buildings which are one or two stories high with basements. The following calculation is based on eight-foot flooding and assumes that, on average, one or two story buildings with basements receive 49% damage (Understanding Your Risks, Identifying Hazards and Estimating Losses, FEMA page 4-13):

Potential Structure Damage: 49%
Approximately 443 structures assessed at $600,000 = $130,242,000 potential damage

[11] "Understanding Your Risks, Identifying Hazards and Estimating Losses", FEMA, page 4-13.

The following calculation is based on four-foot flooding and assumes that, on average, one or two story buildings with basements receive 28% damage (Understanding Your Risks, Identifying Hazards and Estimating Losses, FEMA page 4-13):

Potential Structure Damage: 28%
Approximately 443 structures assessed at $600,000 = $74,424,000 potential damage

The following calculation is based on two-foot flooding and assumes that, on average, one or two story buildings with basements receive 20% damage (Understanding Your Risks, Identifying Hazards and Estimating Losses, FEMA page 4-13):

Potential Structure Damage: 20%
Approximately 443 structures assessed at $600,000 = $53,160,000 potential damage

Several areas of Exeter were identified as having high risk of flooding. These areas are identified in Chapter III and Map 2: Past and Future Hazards. Potential losses were also calculated for these at-risk areas in the same manner as those structures in the 100 and 500 year floodplains. Again these assessments are only based on the potential damages to building within the identified at-risk areas.

~Dam Breach and Failure

Dam breach and failure could impact Exeter through flooding. Potential losses will depend on the extent of the breach and could include both residential and non-residential damage, including town owned facilities. Areas identified by the Hazard Mitigation Planning Committee as at risk to flooding from dam breech were the neighborhoods located below Pickpocket Dam and Colcord Pond Dam, and the Water Treatment Plant and Portsmouth Avenue box culverts below the Reservoir Dam.

Hurricane/ High Wind Events

~Hurricane

Hurricanes do affect the Northeast coast periodically. Since 1900, 2 hurricanes have made landfall in the State of New Hampshire. Due to the coastal location of the Town of Exeter, hurricanes and storm surges present a real hazard to the community. Even degraded hurricanes or tropical storms could still cause significant damage to the structures and infrastructure of the Town of Exeter. The assessed value of all residential and commercial structures in the Town of Exeter, including exempt structures such as schools and churches, is $1,757,014,539 (Assuming 1% to 5% damage), a hurricane could result in $17,570,145 to $87,850,727of structure damage.

~Tornado

Tornadoes are relatively uncommon natural hazards in New Hampshire. On average, about six touch down each year. Damage largely depends on where the tornado strikes. If is strikes an inhabited area, the impact could be severe. In the State of New Hampshire, the total cost of tornadoes between 1950 and 1995 was $9,071,389 (The Disaster Center). The assessed value of all residential and commercial structures in the Town of Exeter, including exempt structures such as schools and churches, is $1,757,014,539 (Assuming 1% to 5% damage), a tornado could result in $17,570,145 to $87,850,727of structure damage.

~Severe Lightning
The amount of damage caused by lightning will vary according to the type of structure hit and the type of contents inside. There is now record of monetary damages inflicted in the Town of Exeter from lightning strikes.

Severe Winter Weather

~Heavy Snowstorms
Heavy snowstorms typically occur during January and February. New England usually experiences at least one or two heavy snow storms with varying degrees of severity each year. Power outages, extreme cold and impacts to infrastructure are all effects of winter storms that have been felt in Exeter in the past. All of these impacts are a risk to the community, including isolation, especially of the elderly, and increased traffic accidents. Damage caused as a result of this type of hazard varies according to wind velocity, snow accumulation and duration. The assessed value of all residential and commercial structures in the Town of Exeter, including exempt structures such as schools and churches, is $1,757,014,539. Assuming 1% to 5% damage, a heavy snowstorm could result in $17,570,145 to $87,850,727of structure damage.

~Ice Storms
Ice storms often cause widespread power outages by downing power lines, making power lines at risk in Exeter. They can also cause severe damage to trees. In 1998, an ice storm inflicted $12,466,202 worth of damage to New Hampshire as a whole and in 2008 PSNH estimates the cost of power restoration effort estimated at $75 million for the state of NH. Ice storms in Exeter could be expected to cause damage ranging from a few thousand dollars to millions of dollars, depending on the severity of the storm.

Wildfire
The risk of fire is difficult to predict based on location. Forest fires are more likely to occur during years of drought. The area identified as at risk to wildfire (Map 2: Past and Future Hazards) by the Hazard Mitigation Committee is in the northern section of Town and includes the Town Forest. The assessed value of all residential and commercial structures in the Town of Exeter, including exempt structures such as schools and churches, is $1,757,014,539. Assuming 1% to 5% damage, a wildfire could result in $17,570,145 to $87,850,727of structure damage.

Earthquakes
Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines and are often associated with landslides and flash floods. Four earthquakes in New Hampshire between 1924-1989 had a magnitude of 4.2 or more. Two of these occurred in Ossipee, one west of Laconia, and one near the Quebec border. If an earthquake were to impact the Town of Exeter, underground lines would be susceptible. In addition, buildings that are not built to a high seismic design level would be susceptible to structural damage. The assessed value of all residential and commercial structures in the Town of Exeter, including exempt structures such as schools and churches, is $1,757,014,539. Assuming 1% to 5% damage, an earthquake could result in $17,570,145 to $87,850,727of structure damage.

CHAPTER VI. EXISTING HAZARD MITIGATION PROGRAMS

The next step involves identifying existing mitigation strategies for the hazards likely to affect the town and evaluate their effectiveness. This section outlines those programs and recommends improvements and changes to these programs to ensure the highest quality emergency service possible.

Table 9: Existing Hazard Mitigation Programs for the Town of Exeter.

Existing Protection	Description-Area Covered	Responsible Local Agent	Effectiveness (Poor, Avg., Good)	Recommended Changes-Actions-Comments
Town of Exeter Local Emergency Management Plan	Town-wide	EMD, Police and Fire Departments, DPW	Good	Plan is updated every 3 years.
Zoning Regulations	Town-wide	Code Enforcement Office	Good	Review and amended annually.
Town Building Code	Town-wide	Building Inspector	Good	Adopt Seismic Design Code
NFIP Floodplain Ordinance	Development restriction in Special Flood Hazard Areas	Building Inspector and Planning Board	Good	Reviewed annually to correspond with federal guidelines and town priorities.
Town Master Plan	Town-wide	Town Planner, Planning Board	Good	Updates occur annually.
Town Capital Improvements Plan	Town-wide	Town Administrator/Department Heads	Good	Updated annually and should review mitigation actions as found in this plan prior to update.
Elevation Certificates	Component of building permit	Building Inspector	Good	Should be reviewed annually for NFIP compliance and effectiveness.
Flood Warning System	Town-wide	Emergency Management Director	Average	Increase public education on cable access channel, town report, water and sewer bills
Emergency Services	Town-wide	EMD, Police Chief, Fire Chief	Good	Emergency Personnel training occurs regularly for effective emergency response.
CEMPS (Comprehensive Emergency Management Planning for Schools)	Schools	SAU 16 Superintendent, EMD	Good	Should be annually reviewed for town and school official emergency preparedness.
FEMA Community Rating System	Town-wide	Building Inspector	Average	Consider applying for CRS
Emergency Water Plan	Town Water System	Water and Sewer Department	Good	Revisions are forthcoming and plan should be reviewed annually.

Existing Protection	Description-Area Covered	Responsible Local Agent	Effectiveness (Poor, Avg., Good)	Recommended Changes-Actions-Comments
Wellhead Protection	Specific areas of town	Code Enforcement Officer	Good	Regularly reviewed for use violations and compliance.
Wetlands Protection	Specific areas of town	Code Enforcement Officer	Good	Town has designated Prime Wetlands
Shoreland Protection	Specific areas of town	Code Enforcement Officer and Building Inspector	Good	Town follows state and local regulations pertinent to the zoning district.
Aquifer Protection	Specific areas of town	Code Enforcement Officer	Good	Ordinance should be monitored to ensure latest BMP's are being utilized for development uses.
Hazardous Materials Plan	Town-side	Emergency Management Director	Good	On-going training for terrorist response
Exeter River Corridor and Watershed Management Plan	Exeter River watershed	Exeter River Local Advisory Committee and Exeter Conservation Commission	Good	Plan is currently being reviewed and updated.
Exeter River Study	Exeter River watershed in Exeter	Exeter River Study Committee	Good	Conducting studies on use and management of the Exeter River and its tributaries
Tree Maintenance/Hazardous Tree Program	Town-wide	Department of Public Works	Needs additional resources	Forest management plan needed
Local Road Design Standards	Town-wide	Planning Board, Code Enforcement Officer, DPW	Good	Standards should be reviewed annually to ensure best practices are being utilized
Bridge Design and Inspection	Town-wide	State DOT and Town DPW	Good	Implement engineering review proposed by DPW
Storm Drain/Culvert Maintenance Program	Town-wide	Department of Public Works	Good	Implement engineering review proposed by DPW
State and Local Dam Program	NHDES/Town/ Private Owners	Department of Public Works	Average	Establish a dam warning system
Emergency Backup Power	Exeter Safety Complex, Exeter Town Office, portable generators	Emergency Management Director	Average	DPW and Elementary Schools, and public works department are in need of back-up power. Town offices back-up power is undersized
Mitigation Grants	Town-wide	EMD, DPW	Good	Grant opportunity especially as they relate to Mitigation Action listed in this plan should be reviewed for possible applicability.

Existing Protection	Description-Area Covered	Responsible Local Agent	Effectiveness (Poor, Avg., Good)	Recommended Changes-Actions-Comments
Geographic Information Systems (GIS)	Town-wide	Planning and Building Department, Assessor's Office, DPW	Good	Making sure the latest software for GIS mapping for map dispersion will promote effective emergency response.

CHAPTER VII. NEWLY IDENTIFIED MITIGATION STRATEGIES/ ACTIONS

• Potential Mitigation Strategies

The Action Plan was developed by analyzing the existing Town programs, the proposed improvements and changes to these programs. Additional programs were also identified as potential mitigation strategies. These potential mitigation strategies were ranked in five categories according to how they accomplished each item:

- Prevention
- Property Protection
- Structural Protection
- Emergency Services
- Public Information and Involvement

Table 10: List of Hazard Mitigation Strategies or Actions Developed by the Natural Hazard Mitigation Committee

Mitigation Strategies or Action	Mitigation Category	Hazard(s) Mitigated	Description	Status 2012: New/Completed/Deferred/Removed
Radio Upgrade/Repeater/Inter operability	Emergency Services	All Hazards	None	Deferred- The goal is to enhance this strategy for all town emergency departments.
Emergency Operations Center/Second Fire Station	Emergency Services	All Hazards	None	Deferred- This strategy is still being reviewed by town officials.
Sand Bag Filling Station	Emergency Services	All Hazards	None	Complete
Public Outreach Program for Hazard Mitigation	Emergency Services	All Hazards	None	Deferred- Public outreach programs through mailings, the town website and other forms of notice are continuous to promote effective hazard mitigation techniques on the individual level.
Portable Lights (2)	Emergency Services	All Hazards	None	Deferred- One lighting unit has been obtained. Funding sources for obtaining the other light is being researched.
16' Shallow Draft Boat and Motor	Emergency Services	All Hazards	None	Complete- No longer a hazard mitigation priority project and has been obtained.

Mitigation Strategies or Action	Mitigation Category	Hazard(s) Mitigated	Description	Status 2012: New/Completed/Deferred/Removed
Modifications to Great Dam	Structural Project	Flooding	The town is reviewing possible approaches to mitigating the flood and hazard potential of Great Dam.	Deferred- the town is reviewing recommendations and studies as it relates to potential dam removal.
Modifications to Pickpocket Dam	Structural Project	Flooding	None	Removed- This is no longer an emergency structural priority at this time
Modifications to Colcord Pond Dam	Structural Project	Flooding	Seepage occurs on far end of dam. The area where this dam is located also serves as a recreation location. Potential repairs to the earthen sides may reduce seepage within the dam.	Deferred- DPW and the town are still considering options for fixing this dam.
Exeter River Level Monitoring	Prevention	Flooding	River gauges placed further up river (Hague Road) as well as Great Dam would give emergency personnel effective warning information regarding flood stage and water levels during storm events.	Deferred- River gauge needed at Great Dam as well as Hague Road for water level monitoring purposes.
Upgrade Exeter Reservoir Dam Spillway	Prevention/Structural	Flooding	None	Completed
Move and or Upgrade (Modified flood proofing) Exeter Water Treatment Plant	Structural	Flooding	The costs associated with moving the treatment facility are large and a careful cost benefit and feasibility analysis would have to be carried out and evaluated prior to occurrence.	Deferred- The town is evaluating effective strategies for managing water treatment as it relates to EPA regulations, and future service needs.
Culvert Inventory/Capacity/ Condition Analysis	Prevention/Structural	Flooding	Examination of culverts to ensure capacities are and will be met in the future for storm events in town	Deferred- Continued examination of Exeter's stormwater infrastructure occurs annually.
Study Use and Management of Exeter River	Prevention, Public Education, Property Protection	Flooding	Continued examination related to land use and impact to the Exeter River and Great Dam	Deferred- This is continued and is more related to Great Dam's Feasibility Study.

Mitigation Strategies or Action	Mitigation Category	Hazard(s) Mitigated	Description	Status 2012: New/Completed/Deferred/Removed
Local routes evacuation/planning exercise	Emergency Services, Public Education	All Hazards	Evacuation planning is occurring at a regional level with communities in the seacoast and Rockingham County evaluating evacuation routes and emergency preparedness.	New
Powder Mill Road Flood Analysis/Capacity assessment	Prevention	Flooding	An analysis of this area for possible road elevation, railroad bridge modification is needed before alteration to increase flood capacity.	New
Debris removal on rail line as identified on the past and future hazards map	Prevention	Wildfire	Removing debris near the rail line will lower the risk of wildfire during periods of sustained drought coupled with train use.	New
Acquisition of development rights/conservation of Exeter Elms	Prevention/Property Protection	Flooding	This area floods regularly and may be better suited for conservation as the risk potential for property damage, water contamination and loss of life is high during snow melt and heavy rains.	New
Reverse 911 for community outreach	Prevention, Emergency Services, Public Outreach	All Hazards	This will allow emergency service providers to warn the public through phone connection of potentially serious hazard events.	New
Mobile Signage	Public Information	All Hazards	Acquiring fixed or mobile signage boards will allow emergency services to provide effective warning notification of hazard events and hazard areas in town.	New
Wastewater Vacuum Truck	Emergency Services	Flooding	The current vacuum truck is older and is needed to be replaced by a more modern piece of equipment.	New

Mitigation Strategies or Action	Mitigation Category	Hazard(s) Mitigated	Description	Status 2012: New/Completed/Deferred/Removed
Replacement of undersized water lines	Property protection, Emergency Services	All Hazards	Water lines in town (specifically Downtown/JD Hill) used for effective fire suppression are in need of replacement.	New
Building Code change to require fuel system fastening in 100-500 year flood plain	Prevention, Property Protection	Flooding	Homes built in the 500 year floodplain should be required to fasten their fuel systems because of flood damage and hazards associated with the dislodgment of those fuel systems.	New
Develop a Low Impact Development (LID) incentive program for stormwater management	Property Protection, Prevention	Flooding	Providing an incentive program for the use of LID may be an effective stormwater management tool that will reduce flood potential, stormwater infrastructure management, and improve water quality in various areas of town.	New
Evaluate sea level rise impact to current and future water treatment facilities	Property Protection, Prevention	Flooding	Evaluating vulnerability and impact associated with sea level rise and potential storm surge to public and private infrastructure can be a cost saving endeavor and improve future hazard preparedness.	New

CHAPTER VIII. FEASIBILITY AND PRIORITIZATION OF PROPOSED MITIGATION STRATEGIES

The goal of each strategy or action is reduction or prevention of damage from a hazard event. In order to determine their effectiveness in accomplishing this goal, a set of criteria was applied to each proposed strategy. A set of questions developed by the Committee that included the STAPLEE method was developed to rank the proposed mitigation actions. The STAPLEE method analyzes the Social, Technical, Administrative, Political, Legal, Economic and Environmental aspects of a project and is commonly used by public administration officials and planners for making planning decisions. The following questions were asked about the proposed mitigation strategies identified in Table 10:

- Does it reduce disaster damage?
- Does it contribute to other goals?
- Does it benefit the environment?
- Does it meet regulations?
- Will historic structures be saved or protected?
- Does it help achieve other community goals?
- Could it be implemented quickly?

STAPLEE criteria:

- **Social**: Is the proposed strategy socially acceptable to the community? Are there equity issues involved that would mean that one segment of the community is treated unfairly?
- **Technical**: Will the proposed strategy work? Will it create more problems than it solves?
- **Administrative**: Can the community implement the strategy? Is there someone to coordinate and lead the effort?
- **Political**: Is the strategy politically acceptable? Is there public support both to implement and to maintain the project?
- **Legal**: Is the community authorized to implement the proposed strategy? Is there a clear legal basis or precedent for this activity?
- **Economic**: What are the costs and benefits of this strategy? Does the cost seem reasonable for the size of the problem and the likely benefits?
- **Environmental**: How will the strategy impact the environment? Will the strategy need environmental regulatory approvals?

Each proposed mitigation strategy was evaluated using the above criteria and assigned a score (Good = 3, Average = 2, Poor = 1) based on the above criteria. An evaluation chart with total scores for each strategy can be found in the collection of individual tables under Table 11a - 11 p.

Table 11a: Mitigation Action: Radio Upgrade/Repeater/Interoperability (Deferred)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Average	2
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Average	2
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Good	3
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Average	2
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Good	3
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Average	2
E: Are other Environmental approvals required?	Good	3
		38

Table 11b: Mitigation Action: Emergency Operations Center/Second Fire Station (Deferred)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Average	2
Does it meet regulations?	Average	2
Will historic structures be saved or protected?	Average	2
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Average	2
S: Is it Socially acceptable?	Average	2
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Average	2
P: Is it Politically acceptable?	Average	2
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Average	2
E: Are other Environmental approvals required?	Average	2
		33

Table 11c: Mitigation Action: Public Outreach Program for Hazard Mitigation (Deferred)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Good	3
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Good	3
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Good	3
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Good	3
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Good	3
E: Are other Environmental approvals required?	Good	3
		42

Table 11d: Mitigation Action: Obtain Portable Lights (1) (Deferred)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Average	2
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Poor	1
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Average	2
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Good	3
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Good	3
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Average	2
E: Are other Environmental approvals required?	Good	3
		37

Table 11e: Mitigation Action: Modifications to Great Dam (Deferred)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Average	2
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Average	2
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Poor	1
S: Is it Socially acceptable?	Average	2
T: Is it Technically feasible and potentially successful?	Average	2
A: Is it Administratively workable?	Average	2
P: Is it Politically acceptable?	Good	3
L: Is there Legal authority to implement?	Poor	1
E: Is it Economically beneficial?	Average	2
E: Are other Environmental approvals required?	Poor	1
		30

Table 11f: Mitigation Action: Modifications to Colcord Pond Dam (Deferred)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Good	3
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Average	2
Does it help achieve other community goals?	Average	2
Could it be implemented quickly?	Poor	1
S: Is it Socially acceptable?	Poor	1
T: Is it Technically feasible and potentially successful?	Average	2
A: Is it Administratively workable?	Average	2
P: Is it Politically acceptable?	Poor	1
L: Is there Legal authority to implement?	Average	2
E: Is it Economically beneficial?	Poor	1
E: Are other Environmental approvals required?	Poor	1
		27

Table 11g: Mitigation Action: Exeter River Level Monitoring (Deferred)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Good	3
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Good	3
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Good	3
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Good	3
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Good	3
E: Are other Environmental approvals required?	Good	3
		42

Table 11h: Mitigation Action: Modified Flood Proofing to Exeter Water Treatment Plant (Deferred/New)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Good	3
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Good	3
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Average	2
S: Is it Socially acceptable?	Average	2
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Average	2
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Average	2
E: Are other Environmental approvals required?	Average	2
		37

Table 11i: Mitigation Action: Culvert Inventory/Capacity/Condition Analysis (Deferred)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Good	3
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Good	3
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Good	3
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Good	3
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Good	3
E: Are other Environmental approvals required?	Good	3
		42

Table 11j: Mitigation Action: Local Routes Evacuation/Planning Exercise (new)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Average	2
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Average	2
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Poor	1
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Good	3
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Good	3
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Average	2
E: Are other Environmental approvals required?	Good	3
		37

Table 11k: Mitigation Action: Powder Mill Road Flood Analysis/Capacity assessment (New)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Poor	1
Does it contribute to other goals?	Average	2
Does it benefit the environment?	Good	3
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Poor	1
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Good	3
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Good	3
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Average	2
E: Are other Environmental approvals required?	Good	3
		36

Table 11l: Mitigation Action: Debris removal on rail line as identified on the future hazards map (new)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Average	2
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Good	3
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Good	3
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Good	3
L: Is there Legal authority to implement?	Average	2
E: Is it Economically beneficial?	Good	3
E: Are other Environmental approvals required?	Average	2
		39

Table 11m Mitigation Action: Consider acquiring development rights/ conservation rights of Exeter Elms (new)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Good	3
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Average	2
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Good	3
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Good	3
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Good	3
E: Are other Environmental approvals required?	Good	3
		41

Table 11n Mitigation Action: Reverse 911 for Community Outreach (new)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Good	3
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Good	3
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Good	3
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Good	3
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Good	3
E: Are other Environmental approvals required?	Good	3
		42

Table 11o: Mitigation Action: Acquire Wastewater Vacuum Truck (new)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Good	3
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Good	3
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Good	3
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Good	3
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Good	3
E: Are other Environmental approvals required?	Good	3
		42

Table 11p: Mitigation Action: Replacement of Undersized Water Lines (new)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Good	3
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Good	3
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Average	2
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Good	3
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Good	3
E: Are other Environmental approvals required?	Good	3
		41

Table 11q: Mitigation Action: Building Code Change to require fuel tank fastening in 100-500 year flood plain (new)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Good	3
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Good	3
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Good	3
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Average	2
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Good	3
E: Are other Environmental approvals required?	Good	3
		41

Table 11r: Mitigation Action: Develop a Low Impact Development (LID) incentive program for stormwater management (new)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Average	2
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Good	3
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Average	2
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Good	3
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Average	2
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Good	3
E: Are other Environmental approvals required?	Good	3
		37

Table 11s: Mitigation Action: Evaluate sea level rise impact to current and future water treatment facility(s) (new)

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Good	3
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Good	3
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Good	3
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Poor	1
P: Is it Politically acceptable?	Poor	1
L: Is there Legal authority to implement?	Poor	1
E: Is it Economically beneficial?	Good	3
E: Are other Environmental approvals required?	Good	3
		35

Table 11t: Mitigation Action: Study Use and Management of the Exeter River

Criteria	Evaluation Rating	Score
Does it reduce disaster damage?	Good	3
Does it contribute to other goals?	Good	3
Does it benefit the environment?	Good	3
Does it meet regulations?	Good	3
Will historic structures be saved or protected?	Good	3
Does it help achieve other community goals?	Good	3
Could it be implemented quickly?	Good	3
S: Is it Socially acceptable?	Good	3
T: Is it Technically feasible and potentially successful?	Good	3
A: Is it Administratively workable?	Good	3
P: Is it Politically acceptable?	Good	3
L: Is there Legal authority to implement?	Good	3
E: Is it Economically beneficial?	Good	3
E: Are other Environmental approvals required?	Good	3
	Good	**42**

CHAPTER IX. IMPLEMENTATION SCHEDULE FOR PRIORITY MITIGATION STRATEGIES

This step involves developing an action plan that outlines who is responsible for implementing each of the prioritized strategies determined in the previous step, as well as when and how the actions will be implemented. Each strategy was evaluated and prioritized according to the STAPLEE score and level of importance within the community. Projects that might have gotten a low STAPLEE score because of criteria associated with environmental permitting, or costs associated with the project may still be of high importance and thus a high rank due to the associated risks and hazards avoided or mitigated from the action if implemented. Priority for each strategy was grouped on a 1-4 sliding scale in which strategies that received a 1 were considered high priority and those that received a score of 4, though important, were of lower priority. This form of prioritization was used as a basis for developing the Action Plan.

WHO? Who will lead the implementation efforts? Who will put together funding requests and applications?

HOW? How will the community fund these projects? How will the community implement these projects? What resources will be needed to implement these projects?

WHEN? When will these actions be implemented, and in what order?

Table 12 is the Action Plan. In addition to the prioritized mitigation projects, Table 12 includes the responsible party (WHO), how the project will be supported (HOW), and what the timeframe is for implementation of the project (WHEN). Also included is a cost estimate for each project if available.

Table 12: Action Plan for Proposed Mitigation Actions

STAPLEE Score (Priority)	Project	Responsibility/ Oversight	Funding/ Support	Estimated Cost	Time frame
42 (1)	Public Outreach Program for Hazard Mitigation	Town Manger/EMD/ DPW	Local/State and Federal Grants	$5,000	2012-2017
42(1)	Reverse 911 for Community Outreach	Fire Department/EMD/ DPW	Local/State and Federal Grants	$10,000-$20,000	2012-2014
42(1)	Acquire Wastewater Vacuum Truck	DPW	Local/State and Federal Grants	$325,000	2012-2013
42 (1)	Culvert Inventory/Capacity/ Condition Analysis	DPW	Local	$10,000	2012-2017
37(1)	Local Routes Evacuation Planning and Exercises	Police/EMD/DPW	Local/State and Federal Grants	$10,000	2012-2013
37(1)	Obtain Portable Lights (1)	Fire Department	Local/State and Federal Grants	$22,000	2012
33 (1)	Emergency Operations Center/Second Fire Station	Fire/Police/EMD	Local/State and Federal Grants	$4.5 million	2014

STAPLEE Score (Priority)	Project	Responsibility/ Oversight	Funding/ Support	Estimated Cost	Time frame
42(2)	Study Use and Management of Exeter River	Town Manager/ DPW/Board of Selectmen	Local/State and Federal Grants	$20,000-$40,000	2012-2017
38 (2)	Radio Upgrade/Repeater/Intero perability	Fire/Police/EMD	Local/State and Federal Grants	$175,000	2013
37(2)	Modified flood proofing to Exeter Water treatment Plant	DPW	Local/State and Federal Grants	$500,000-$3,000,000	2012-2015
30(2)	Modifications to great Dam	DPW	Local/State and Federal Grants	$2,000,000	2012-2014
41 (3)	Exeter River Level Monitoring	DPW/EMD	Local/State and Federal Grants	$50,000	2014
41(3)	Replacement of Undersized Water Lines	DPW	Local/State and Federal Grants	$20,000,000	2012-2017
39(3)	Debris Removal on rail Line as identified on the Future Hazard Map	EMD/Fire Department	Local	$5,000	2014
37(3)	Develop a low impact development (LID) incentive program for stormwater management	DPW/Planning Department	Local/State and Federal Grants	$5,000-10,000	2012-2017
41(4)	Building code change to require fuel tank fastening within 100-500 year flood plains	Town Manager/BOS/Fire Department/EMD	Local	$5,000	2016
41(4)	Consider acquiring development rights/conservation rights of Exeter Elms	Town Manager/BOS/ EMD	Local/State and Federal Grants	$1 million	2016
36(4)	Powder Mill Flood Analysis/Capacity Assessment	DPW	Local/State and Federal Grants	$1,000,000 - $3 million	2017
35(4)	Evaluate sea level rise impact to current and future water and sewer treatment facilities	DPW/Planning Department	Local/State and Federal Grants	$5,000	2012-2017
27 (4)	Modifications to Colcord Pond Dam	DPW	Local/State and Federal Grants	$500,000	2012-2017

CHAPTER X. MONITORING, EVALUATING AND UPDATING THE PLAN

Incorporating the Plan into Existing Planning Mechanisms

Upon completion and approval by FEMA and the State of New Hampshire, the Plan will be adopted as a standalone document of the Town and as an appendix of the Town's Emergency Operations Plan (EOP). An update of the EOP is continuing; future updates to the EOP will incorporate the Plan as a referenced appendix, but the two plans will always be printed as separated documents. The EOP is subject to annual review.

The town has utilized the 2006 Hazard Mitigation Plan and the following strategies for incorporation into other planning mechanisms:

- Mitigation strategies #1 & 12; the town used the plan to create a committee that has been tasked with studying the Exeter River and its impact on the community. This committee has worked with several engineers and contractors to help decide the best approach to managing the storm water flows and also looked into modifications and/or removal of Great Dam. This committee is ongoing and hopes to bring a recommendation to the Board of Selectmen and perhaps voters by the March 2013 Town meeting;

- Mitigation Strategy #6 was used during the budget process in FY09, when voters were asked to upgrade and reinforce the existing concrete spillway from the Exeter drinking water reservoir into Wheelwright Creek;

- Mitigation strategy #7 was used to during the CIP process in FY10 when the Town of Exeter, Division of Emergency Management proposed the purchase of a sand bag fill station. This station was purchased and now assists in the efficient filling of sand bags to prevent additional flooding at identified critical infrastructure;

- Mitigation strategy #8 was used during the FY11 CIP process, and the voters approved a Bond for $6.3 million to upgrade existing ground water sources and drill new ground water wells near Lary Lane, so we can begin to move away from using surface water from the Exeter River and Reservoir;

- Mitigation starategy#9 & 11 was used during the budget process to reinforce the need for a new boat and lighting unit to be used during emergency operations. Both the boat and lighting unit have been used repeatedly in the storms from 2007-2011.

Currently, the town is utilizing the 2012 plan update in the following ways:

- Exeter emergency operations personnel are using the proposed plan during this year's budget and CIP process to help demonstrate the need for additional planning and response equipment. ;

- The town has added additional pages to their website with information and preparedness tips to the community, and have created short clips for their local public access TV programming;

- A program called Code Red has been requested in this year's operating budget to provide the community with reverse 911 capabilities;

- Old and undersized water mains have been identified and are currently being added to the town's master plan for future replacement;

- The wastewater vacuum truck and second portable lighting unit has been worked into the CIP process and if not purchased this year are planned for future years 2013-2018;

- The plan was helpful in outlining the need for the Town of Exeter to participate in the Seacoast Evacuation Study and a draft plan has been distributed for review, we were assisted by the NH Dept. of Homeland Security and Emergency Management;

- A second fire station on Continental Drive has been proposed and will come before the voters in March, 2013. This station has been proposed with a new Emergency Operations Center that can serve as the primary or back-up site should the need arise; and

- Lastly, Exeter was just informed on Monday evening, October 15 that the plan was used to aide in the Town of Exeter receiving a grant in conjunction with the University of NH to study climate change, temperature rise and the effects it will likely have on sea level and lowland areas involving the Town of Exeter.

In the future, the Hazard Mitigation Plan will be consulted when the Town updates its Capital Improvement Program (CIP). The Capital Improvements Committee is responsible for updating the CIP annually, and will review the Action Plan, as it has done before, during each update. This committee in conjunction with Exeter Emergency Management will determine what items can and should be added to the CIP based on the Town's annual budget and possible sources of other funding. Portions of this plan should be referred to when updates to the towns Master Plan takes place. Considerations about future land use and proximity to current and potential hazard areas need to be inherently part of the planning process. NH RSA 674:2 (d) gives towns the authority to include a natural hazards section, which documents the physical characteristics, severity, and extent of any potential natural hazards to the community, within the framework of a Master Plan.

Monitoring, Evaluating and Updating the Plan

Recognizing that many mitigation projects are continual, and that while in the implementation stage communities may suffer budget cuts, experience staff turnover, or projects may fail altogether, a good plan needs to provide for periodic monitoring and evaluation of its successes and failures and allow for updates of the Plan where necessary.

In order to track progress and update the Mitigation Strategies identified in the Action Plan (Table 11), it is recommended that the Town revisit the Plan annually, or after a hazard event. If it is not realistic or appropriate to revise the Plan every year, then the Plan will be revisited no less than every five years per FEMA requirements. The Emergency Management Director is responsible for initiating this review with members of the Town that are appropriate including members of the public. In keeping with the process of adopting the 2011/12 Plan Update and per NH State RSA 91-A, a public meeting to receive public comment on Plan maintenance and updating will be held during any review of the Plan. This publicly noticed meeting (via town website, and postings in the town office, library, or local newspaper) will allow for members of the community not involved in developing the Plan to provide input and comments each time

the Plan is revised. The final revised Plan will be adopted by the Board of Selectmen appropriately, at a second publicly noticed meeting.

Changes should be made to the Plan to accommodate for projects that have failed or are not considered feasible after a review for their consistency with STAPLEE, the timeframe, the community's priorities, and funding resources. Priorities that were not ranked high, but identified as potential mitigation strategies, should be reviewed as well during the monitoring and update of this Plan to determine feasibility of future implementation.

APPENDIX A:
SUMMARY OF HAZARD MITIGATION STRATEGIES

I. RIVERINE MITIGATION

A. PREVENTION

Prevention measures are intended to keep the problem from occurring in the first place, and/or keep it from getting worse. Future development should not increase flood damage. Building, zoning, planning, and/or code enforcement offices usually administer preventative measures.

1. Planning and Zoning

Land use plans are put in place to guide future development, recommending where - and where not - development should occur. Sensitive and vulnerable lands can be designated for uses that would not be incompatible with occasional flood events - such as parks or wildlife refugees.

A Capital Improvements Program can recommend the setting aside of funds for public acquisition of these designated lands.

The zoning ordinance can regulate development in these sensitive areas by limiting or preventing some or all development - for example, by designating floodplain overlay, conservation, or agricultural districts.

2. Open Space Preservation

Preserving open space is the best way to prevent flooding and flood damage. Open space preservation should not, however, be limited to the flood plain, since other areas within the watershed may contribute to controlling the runoff that exacerbates flooding.

Land Use and Capital Improvement Plans should identify areas to be preserved by acquisition and other means, such as purchasing easements. Aside from outright purchase, open space can also be protected through maintenance agreements with the landowners, or by requiring developers to dedicate land for flood flow, drainage and storage.

3. Floodplain Development Regulations

Floodplain development regulations typically do not prohibit development in the special flood hazard area, but they do impose construction standards on what is built there. The intent is to protect roads and structures from flood damage and to prevent the development from aggravating the flood potential.

Floodplain development regulations are generally incorporated into subdivision regulations, building codes, and floodplain ordinances, which either stand-alone or are contained within a zoning ordinance.

Subdivision Regulations: These regulations govern how land will be divided into separate lots or sites. They should require that any flood hazard areas be shown on the plat, and that every lot has a buildable area that is above the base flood elevation.

Building Codes: Standards can be incorporated into building codes that address flood proofing for all new and improved or repaired buildings.

Floodplain Ordinances: Communities that participate in the National Flood Insurance Program are required to adopt the minimum floodplain management regulations, as developed by FEMA. The regulations set minimum standards for subdivision regulations and building codes. Communities may adopt more stringent standards than those set forth by FEMA.

4. Stormwater Management

Development outside of a floodplain can contribute significantly to flooding by covering impervious surfaces, which increases storm water runoff. Storm water management is usually addressed in subdivision regulations. Developers are typically required to build retention or detention basins to minimize any increase in runoff caused by new or expanded impervious surfaces, or new drainage systems. Generally, there is a prohibition against storm water leaving the site at a rate higher than it did before the development.

One technique is to use wet basins as part of the landscaping plan of a development. It might even be possible to site these basins based on a watershed analysis. Since detention only controls the runoff rates and not volumes, other measures must be employed for storm water infiltration - for example, swales, infiltration trenches, vegetative filter strips, and permeable paving blocks.

5. Drainage System Maintenance

Ongoing maintenance of channel and detention basins is necessary if these facilities are to function effectively and efficiently over time. A maintenance program should include regulations that prevent dumping in or altering watercourses or storage basins; regrading and filling should also be regulated.

Any maintenance program should include a public education component, so that the public becomes aware of the reasons for the regulations. Many people do not realize the consequences of filling in a ditch or wetland, or regrading their yard without concern for runoff patterns.

B. PROPERTY PROTECTION

Property protection measures are used to modify buildings subject to flood damage, rather than to keep floodwaters away. These may be less expensive to implement, as they are often carried out on a cost-sharing basis. In addition, many of these measures do not affect a building's appearance or use, which makes them particularly suitable for historical sites and landmarks.

1. Relocation

Moving structures out of the floodplain is the surest and safest way to protect against damage. Relocation is expensive, however, so this approach will probably not be used except in extreme circumstances. Communities that have areas subject to severe storm surges, ice jams, etc. might want to consider establishing a relocation program, incorporating available assistance.

2. Acquisition

Acquisition by a governmental entity of land in a floodplain serves two main purposes: (1) it ensures that the problem of structures in the floodplain will be addressed; and (2) it has the potential to convert problem areas into community assets, with accompanying environmental benefits.

Acquisition is more cost effective than relocation in those areas that are subject to storm surges, ice jams, or flash flooding. Acquisition, followed by demolition, is the most appropriate strategy for those buildings that are simply too expensive to move, as well as for dilapidated structures that are not worth saving or protecting. Relocation can be expensive, however, there are government grants and loans that can be applied toward such efforts.

3. Building Elevation

Elevating a building above the base flood elevation is the best on-site protection strategy. The building could be raised to allow water to run underneath it, or fill could be brought in to elevate the site on which the building sits.

This approach is cheaper than relocation, and tends to be less disruptive to a neighborhood. Elevation is required by law for new and substantially improved residences in a floodplain, and is commonly practiced in flood hazard areas nationwide.

4. Floodproofing

If a building cannot be relocated or elevated, it may be floodproofed. This approach works well in areas of low flood threat. Flood proofing can be accomplished through barriers to flooding, or by treatment to the structure itself.

Barriers: Levees, floodwalls and berms can keep floodwaters from reaching a building. These are useful, however, only in areas subject to shallow flooding.

Dry Flood proofing: This method seals a building against the water by coating the walls with waterproofing compounds or plastic sheeting. Openings, such doors, windows, etc. are closed either permanently with removable shields or with sandbags.

Wet Flood proofing: This technique is usually considered a last resort measure, since water is intentionally allowed into the building in order to minimize pressure on the structure. Approaches range from moving valuable items to higher floors to rebuilding the floodable area. An advantage over other approaches is that simply by moving household goods out of the range of floodwaters, thousands of dollars can be saved in damages.

5. Sewer Backup Protection

Storm water overloads can cause backup into basements through sanitary sewer lines. Houses that have any kind of connection to a sanitary sewer system - whether it is downspouts, footing drain tile, and/or sump pumps, can be flooded during a heavy rain event. To prevent this, there should be no such connections to the system, and all rain and ground water should be directed onto the ground, away from the building. Other protections include:

- Floor drain plugs and floor drain standpipe, which keep water from flowing out of the lowest opening in the house.
- Overhead sewer - keeps water in the sewer line during a backup.
- Backup valve - allows sewage to flow out while preventing backups from flowing into the house.

6. Insurance

Above and beyond standard homeowner insurance, there is other coverage a homeowner can purchase to protect against flood hazard. Two of the most common are National Flood Insurance and basement backup insurance.

National Flood Insurance: When a community participates in the National Flood Insurance Program, any local insurance agent is able to sell separate flood insurance policies under rules and rates set by FEMA. Rates do not change after claims are paid because they are set on a national basis.

Basement Backup Insurance: National Flood Insurance offers an additional deductible for seepage and sewer backup, provided there is a general condition of flooding in the area that was the proximate cause of the basement getting wet. Most exclude damage from surface flooding that would be covered by the NFIP.

C. NATURAL RESOURCE PROTECTION

Preserving or restoring natural areas or the natural functions of floodplain and watershed areas provide the benefits of eliminating or minimizing losses from floods, as well as improve water quality and wildlife habitats. Parks, recreation, or conservation agencies usually implement such activities. Protection can also be provided through various zoning measures that are specifically designed to protect natural resources.

1. Wetlands Protection

Wetlands are capable of storing large amounts of floodwaters, slowing and reducing downstream flows, and filtering the water. Any development that is proposed in a wetland is regulated by either federal and/or state agencies. Depending on the location, the project might fall under the jurisdiction of the U.S. Army Corps of Engineers, which in turn, calls upon several other agencies to review the proposal. In New Hampshire, the N.H. Wetlands Board must approve any project that impacts a wetland. And, many communities in New Hampshire also have local wetland ordinances.

Generally, the goal is to protect wetlands by preventing development that would adversely affect them. Mitigation techniques are often employed, which might consist of creating a wetland on another site to replace what would be lost through the development. This is not an ideal practice, however, since it takes many years for a new wetland to achieve the same level of quality as an existing one.

2. Erosion and Sedimentation Control

Controlling erosion and sediment runoff during construction and on farmland is important, since eroding soil will typically end up in downstream waterways. And, because sediment tends to settle where the water flow is slower, it will gradually fill in channels and lakes, reducing their ability to carry or store floodwaters.

Practices to reduce erosion and sedimentation have two principal components: (1) minimize erosion with vegetation and; (2) capture sediment before it leaves the site. Slowing the runoff increases infiltration into the soil, thereby controlling the loss of topsoil from erosion and the resulting sedimentation. Runoff can be slowed by vegetation, terraces, contour strip farming, no-till farm practices, and impoundments (such as sediment basins, farm ponds, and wetlands).

3. Best Management Practices

Best Management Practices (BMPs) are measures that reduce nonpoint source pollutants that enter waterways. Nonpoint source pollutants are carried by storm water to waterways, and include such things as lawn fertilizers, pesticides, farm chemicals, and oils from street surfaces and industrial sites.

BMPs can be incorporated into many aspects of new developments and ongoing land use practices. In New Hampshire, the Department of Environmental Services has developed best management practices for a range of activities, from farming to earth excavations.

D. EMERGENCY SERVICES

Emergency services protect people during and after a flood. Many communities in New Hampshire have emergency management programs in place, administered by an emergency management director (very often the local police or fire chief).

1. Flood Warning

On large rivers, the National Weather Service handles early recognition. Communities on smaller rivers must develop their own warning systems. Warnings may be disseminated in a variety of ways, such as sirens, radio, television, mobile public address systems, or door-to-door contact. It seems that multiple or redundant systems are the most effective, giving people more than one opportunity to be warned.

2. Flood Response

Flood response refers to actions that are designed to prevent or reduce damage or injury, once a flood threat is recognized. Such actions and the appropriate parties include:

- activating the emergency operations center (emergency director)
- sandbagging designated areas (public works department)
- closing streets and bridges (police department)
- shutting off power to threatened areas (public service)
- releasing children from school (school district)
- ordering an evacuation (selectmen/city council/emergency director)
- opening evacuation shelters (churches, schools, Red Cross, municipal facilities)

These actions should be part of a flood response plan, which should be developed in coordination with the persons and agencies that share the responsibilities. Drills and exercises should be conducted so that the key participants know what they are supposed to do.

3. Critical Facilities Protection

Protecting critical facilities is vital, since expending efforts on these facilities can draw workers and resources away from protecting other parts of town. Buildings or locations vital to the flood response effort:

- emergency operations centers
- police and fire stations
- hospitals
- highway garages
- selected roads and bridges
- evacuation routes
- Buildings or locations that, if flooded, would create secondary disasters
- hazardous materials facilities
- water/wastewater treatment plants
- schools
- nursing homes

All such facilities should have their own flood response plan that is coordinated with the community's plan. Nursing homes, other public health facilities, and schools will typically be required by the state to have emergency response plans in place.

4. Health and Safety Maintenance

The flood response plan should identify appropriate measures to prevent danger to health and safety. Such measures include:

- patrolling evacuated areas to prevent looting.
- providing safe drinking water.
- vaccinating residents for tetanus.
- clearing streets.
- cleaning up debris.

The plan should also identify which agencies will be responsible for carrying out the identified measures. A public information program can be helpful to educate residents on the benefits of taking health and safety precautions.

Structural Projects

Structural projects are used to prevent floodwaters from reaching properties. These are all man-made structures, and can be grouped into the six types of discussed below. The shortcomings of structural approaches are that:

- They can be very expensive.
- They disturb the land, disrupt natural water flows, and destroy natural habitats.
- They are built to an anticipated flood event, and may be exceeded by a greater-than-expected flood.
- They can create a false sense of security.

Reservoirs

Reservoirs control flooding by holding water behind dams or in storage basins. After a flood peaks, water is released or pumped out slowly at a rate the river downstream can handle.

Reservoirs are suitable for protecting existing development, and they may be the only flood control measure that can protect development close to a watercourse. They are most efficient in deeper valleys or on smaller rivers where there is less water to store. Reservoirs might consist of man-made holes dug to hold the approximate amount of floodwaters, or even abandoned quarries. As with other structural projects, reservoirs:

- are expensive;
- occupy a lot of land;
- require periodic maintenance;
- may fail to prevent damage from floods that exceed their design levels; and
- may eliminate the natural and beneficial functions of the floodplain.

Reservoirs should only be used after a thorough watershed analysis that identifies the most appropriate location, and ensures that they would not cause flooding somewhere else. Because they are so expensive and usually involve more than one community, they are typically implemented with the help of state or federal agencies, such as the Army Corps of Engineers.

Levees/Floodwalls

Probably the best know structural flood control measure is either a levee (a barrier of earth) or a floodwall made of steel or concrete erected between the watercourse and the land. If space is a consideration, floodwalls are typically used, since levees need more space. Levees and floodwalls should be set back out of the floodway, so that they will not divert floodwater onto other properties.

Diversions

A diversion is simply a new channel that sends floodwater to a different location, thereby reducing flooding along an existing watercourse. Diversions can be surface channels, overflow weirs, or tunnels. During normal flows, the water stays in the old

channel. During flood flows, the stream spills over the diversion channel or tunnel, which carries the excess water to the receiving lake or river.

Diversions are limited by topography; they won't work everywhere. Unless the receiving water body is relatively close to the flood prone stream and the land in between is low and vacant, the cost of creating a diversion can be prohibitive. Where topography and land use are not favorable, a more expensive tunnel is needed. In either case, care must be taken to ensure that the diversion does not create a flooding problem somewhere else.

Channel Modifications

Channel modifications include making a channel wider, deeper, smoother, or straighter. These techniques will result in more water being carried away, but, as with other techniques mentioned, it is important to ensure that the modifications do not create or increase a flooding problem downstream.

Dredging: Dredging is often cost-prohibitive because the dredged material must be disposed of somewhere else, and the stream will usually fill back in with sediment. Dredging is usually undertaken only on larger rivers, and then only to maintain a navigation channel.

Drainage modifications: These include man-made ditches and storm sewers that help drain areas where the surface drainage system is inadequate or where underground drainage ways may be safer or more attractive. These approaches are usually designed to carry the runoff from smaller, more frequent storms.

Storm Sewers

Mitigation techniques for storm sewers include installing new sewers, enlarging small pipes, street improvements, and preventing back flow. Because drainage ditches and storm sewers convey water faster to other locations, improvements are only recommended for small local problems where the receiving body of water can absorb the increased flows without increased flooding.

In many developments, streets are used as part of the drainage system, to carry or hold water from larger, less frequent storms. The streets collect runoff and convey it to a receiving sewer, ditch, or stream. Allowing water to stand in the streets and then draining it slowly can be a more effective and less expensive measure than enlarging sewers and ditches.

Public Information

Public information activities are intended to advise property owners, potential property owners, and visitors about the particular hazards associated with a property, ways to protect people and property from these hazards, and the natural and beneficial functions of a floodplain.

1. **Map Information**

Flood maps developed by FEMA outline the boundaries of the flood hazard areas. These maps can be used by anyone interested in a particular property to determine if it is flood-prone. These maps are available from FEMA, the NH Office of Emergency Management, the NH Office of State Planning, or your regional planning commission.

Outreach Projects

Outreach projects are proactive; they give the public information even if they have not asked for it. Outreach projects are designed to encourage people to seek out more information and take steps to protect themselves and their properties. Examples of outreach activities include:

- Mass mailings or newsletters to all residents.
- Notices directed to floodplain residents.
- Displays in public buildings, malls, etc.
- Newspaper articles and special sections.
- Radio and TV news releases and interview shows.
- A local flood proofing video for cable TV programs and to loan to organizations.
- A detailed property owner handbook tailored for local conditions.
- Presentations at meetings of neighborhood groups.

Research has shown that outreach programs work, although awareness is not enough. People need to know what they can do about the hazards, so projects should include information on protection measures. Research also shows that locally designed and run programs are much more effective than national advertising.

Real Estate Disclosure

Disclosure of information regarding flood-prone properties is important if potential buyers are to be in a position to mitigate damage. Federally regulated lending institutions are required to advise applicants that a property is in the floodplain. However, this requirement needs to be met only five days prior to closing, and by that time, the applicant is typically committed to the purchase. State laws and local real estate practice can help by making this information available to prospective buyers early in the process.

Library

Your local library can serve as a repository for pertinent information on flooding and flood protection. Some libraries also maintain their own public information campaigns, augmenting the activities of the various governmental agencies involved in flood mitigation.

Technical Assistance

Certain types of technical assistance are available from the NFIP Coordinator, FEMA, and the Natural Resources Conservation District. Community officials can also set up a service delivery program to provide one-on-one sessions with property owners.

An example of technical assistance is the flood audit, in which a specialist visits a property. Following the visit, the owner is provided with a written report, detailing the past and potential flood depths, and recommending alternative protection measures.

Environmental Education

Education can be a great mitigating tool, if people can learn what not to do before damage occurs. And the sooner the education begins, the better. Environmental education programs for children can be taught in the schools, park and recreation departments, conservation associations, or youth organizations. An activity can be as involved as course curriculum development or as simple as an explanatory sign near a river.

Education programs do not have to be limited to children. Adults can benefit from knowledge of flooding and mitigation measures. And decision-makers, armed with this knowledge, can make a difference in their communities.

II. EARTHQUAKES

A. PREVENTIVE

Planning/zoning to keep critical facilities away from fault lines.
Planning, zoning and building codes to avoid areas below steep slopes or soils subject to liquefaction.
Building codes to prohibit loose masonry, overhangs, etc.

B. PROPERTY PROTECTION

Acquire and clear hazard areas.
Retrofitting to add braces, remove overhangs.
Apply mylar to windows and glass surfaces to protect from shattering glass.
Tie down major appliances, provide flexible utility connections.
Earthquake insurance riders.

C. EMERGENCY SERVICES

Earthquake response plans to account for secondary problems, such as fires and hazardous materials spills.

D. EMERGENCY SERVICES

Slope stabilization.

III. DAM FAILURE

A. PREVENTIVE

Dam failure inundation maps.
Planning/zoning/open space preservation to keep area clear.
Building codes with flood elevation based on dam failure.
Dam safety inspections.
Draining the reservoir when conditions appear unsafe.

B. PROPERTY PROTECTION

Acquisition of buildings in the path of a dam breach flood.
Flood insurance.

C. EMERGENCY SERVICES

Dam conditioning monitoring.
Warning and evacuation plans based on dam failure.

D. EMERGENCY SERVICES

Dam improvements, spillway enlargements.
Remove unsafe dams.

IV. WILDFIRES

A. PREVENTIVE

Zoning districts to reflect fire risk zones.
Planning and zoning to restrict development in areas near fire protection and water resources.
Requiring new subdivisions to space buildings, provide firebreaks, on-site water storage, wide roads multiple accesses.
Building code standards for roof materials, spark arrestors.
Maintenance programs to clear dead and dry bush, trees.
Regulation on open fires.

B. PROPERTY PROTECTION

Retrofitting of roofs and adding spark arrestors.
Landscaping to keep bushes and trees away from structures.
Insurance rates based on distance from fire protection.

C. NATURAL RESOURCE PROTECTION

Prohibit development in high-risk areas.

D. EMERGENCY SERVICES

Fire Fighting

V. WINTER STORMS

A. PREVENTIVE

Building code standards for light frame construction, especially for wind-resistant roofs.

B. PROPERTY PROTECTION

Storm shutters and windows
Hurricane straps on roofs and overhangs
Seal outside and inside of storm windows and check steals in spring and fall.
Family and/or company severe weather action plan & drills:

include a NOAA weather radio
designate a shelter area or location
keep a disaster supply kit, including stored food and water
keep snow removal equipment in good repair; have extra shovels, sand, rock, salt and gas
know how to turn off water, gas, and electricity at home or work

C. NATURAL RESOURCE PROTECTION

Maintenance program for trimming tree and shrubs

D. EMERGENCY SERVICES

Early warning systems/NOAA Weather Radio
Evacuation Plans

APPENDIX B:
TECHNICAL AND FINANCIAL ASSISTANCE FOR HAZARD MITIGATION

Local Municipalities must have a FEMA-approved Hazard Mitigation Plan in order to be eligible for the Hazard Mitigation Grant Program (for a disaster declared after November 1st, 2004) and the Pre-disaster Mitigation Project Grants. Information on these two Grant Programs is listed below. Additional hazard mitigation grant program information follows.

HAZARDS MITIGATION GRANT PROGRAM (HGMP)

Authorized under Section 404 of the Stafford Act, the Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. Hazard Mitigation Grant Program funding is only available in States following a Presidential disaster declaration. Eligible applicants are:

- State and local governments
- Indian tribes or other tribal organizations
- Certain private non-profit organization

Individual homeowners and businesses may not apply directly to the program; however a community may apply on their behalf. HMGP funds may be used to fund projects that will reduce or eliminate the losses from future disasters. Projects must provide a long-term solution to a problem, for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood. In addition, a project's potential savings must be more than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage.

PRE-DISASTER MITIGATION PROGRAM

The Pre-Disaster Mitigation (PDM) program provides technical and financial assistance to States and local governments for cost-effective pre-disaster hazard mitigation activities that complement a comprehensive mitigation program, and reduce injuries, loss of life, and damage and destruction of property. FEMA provides grants to States and Federally recognized Indian tribal governments that, in turn, provide sub-grants to local governments (to include Indian Tribal governments) for mitigation activities such as planning and the implementation of projects identified through the evaluation of natural hazards.

ADDITIONAL HAZARD MITIGATION GRANT PROGRAMS:

FLOOD MITIGATION ASSISTANCE (FMA) PROGRAM

FMA provides funding to assist States and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program (NFIP). There are three types of grants available under FMA: Planning, Project, and Technical Assistance Grants. FMA Planning Grants are available to States and communities to prepare Flood Mitigation Plans. NFIP-participating communities with approved Flood Mitigation Plans can apply for FMA Project Grants. FMA Project Grants are available to States and NFIP participating communities to implement measures to reduce flood losses. Ten percent of the Project Grant is made available to States as a Technical Assistance Grant. These funds may be used by the State to help administer the program. Communities receiving FMA Planning and Project Grants must be participating in the NFIP. A few examples of eligible FMA projects include: the elevation, acquisition, and relocation of NFIP-insured structures. Additional information can be read on the Mitigation Planning pages.

Funding for the program is provided through the National Flood Insurance Fund, and FMA is funded at $20 million nationally. States are encouraged to prioritize FMA project grant applications that include repetitive loss properties. The FY 2001 FMA emphasis encourages States and communities to address target repetitive loss properties identified in the Agency's Repetitive Loss Strategy. These include structures with four or more losses, and structures with 2 or more losses where cumulative payments have exceeded the property value. State and communities are also encouraged to develop Plans that address the mitigation of these target repetitive loss properties.

BEM EMERGENCY MANAGEMENT ASSISTANCE PROGRAM

GUIDELINES:
Emergency Management Assistance (EMA) funding is available to local communities and eligible Agencies for projects that fall in FOUR general areas of Emergency Management: Planning activities; Training activities; Drills and Exercises; and Emergency Management Administration. Contact your New Hampshire Bureau of Emergency Management (BEM) local Field Representative for additional information and an APPLICATION PACKET.
The following list of possible projects and activities is meant to guide you in selecting projects for an EMA Grant Submission. This list of suggested projects is not intended to be all-inclusive. Local communities or agencies may have other specific projects and activities that reflect local needs based on local capability assessments and local hazards.

Planning Activities may include:

- Develop a Hazard Mitigation Plan for your community.
- Prepare a hazard mitigation project proposal for submission to BEM.
- Create, revise, or update Dam Emergency Action plans.
- Update your local Emergency Operations Plan (EOP). Consider updating a number of specific annexes each year to ensure that the entire plan is updated at least every four years.
- If applicable, develop or incorporate a regional HazMat Team Annex into your EOP.
- Develop an Anti-Terrorism Annex into your EOP.
- Develop a local/regional Debris Management Annex into your EOP.
- Develop and maintain pre-scripted requests for additional assistance (from local area public works, regional mutual aid, State resources, etc.) and local declarations of emergency.
- Develop and maintain written duties and responsibilities for EOC staff positions and agency representatives.
- Develop and maintain a list of private non-profit organizations within your local jurisdiction to ensure that these organizations are included in requests for public assistance funds.
- Prepare a submission for nomination as a "Project Impact" Community.

Training Activities may include:

- Staff members attend training courses at the Emergency Management Institute.
- Staff members attend a "field delivered" training course conducted by BEM.
- Staff members attend other local, State, or nationally sponsored training event, which provides skills or knowledge relevant to emergency management.
- Staff members complete one or more FEMA Independent Study Courses.
- Identify and train a pre-identified local damage assessment team.

Drills and Exercises might include:

- Conduct multi-agency EOC Exercise (Tabletop or Functional) and forward an Exercise Evaluation Report, including after action reports, to BEM (external evaluation of exercises is strongly encouraged). Drills or Exercises might involve any of the following scenarios:
    - Hurricane Exercise
    - Terrorism Exercise
    - Severe Storm Exercise
    - Communications Exercise
    - Mass Causality Exercise involving air, rail, or ship transportation accident
- Participate in multi-State or multi-Jurisdictional Exercise and forward Exercise Report to BEM.
- HazMat Exercise with Regional HazMat Teams
- BEM Communications Exercises
- Observe or evaluate State or local exercise outside your local jurisdiction.
- Assist local agencies and commercial enterprises (nursing homes, dams, prisons, schools, etc.) in developing, executing, and evaluating their exercise.
- Assist local hospitals in developing, executing and evaluating Mass Care, HazMat, Terrorism, and Special Events Exercises.
- Administrative Projects and Activities may include:
- Maintain an Emergency Operations Center (EOC) and alternate EOC capable of accommodating staff to respond to local emergencies.
- Establish and maintain a Call-Down List for EOC staff.
- Establish and maintain Emergency Response/Recovery Resource Lists.

- Develop or Update Emergency Management Mutual Aid Agreements with a focus on Damage Assessment, Debris Removal, and Resource Management.
- Develop and maintain written duties and responsibilities for EOC staff positions and agency representatives.
- Develop or Update Procedures for tracking of disaster-related expenses by local agencies.

FLOOD MITIGATION ASSISTANCE (FMA) PROGRAM

FMA was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). FMA regulations can be found in 44 CFR Part 78. Funding for the program is provided through the National Flood Insurance Fund. FMA is funded at $20 million nationally. FMA provides funding to assist States and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program (NFIP).

There are three types of grants available under FMA: Planning, Project, and Technical Assistance Grants. FMA Planning Grants are available to States and communities to prepare Flood Mitigation Plans. NFIP-participating communities with approved Flood Mitigation Plans can apply for FMA Project Grants. FMA Project Grants are available to States and NFIP participating communities to implement measures to reduce flood losses. Ten percent of the Project Grant is made available to States as a Technical Assistance Grant. These funds may be used by the State to help administer the program. Communities receiving FMA Planning and Project Grants must be participating in the NFIP. A few examples of eligible FMA projects include: the elevation, acquisition, and relocation of NFIP-insured structures.

States are encouraged to prioritize FMA project grant applications that include repetitive loss properties. The FY 2001 FMA emphasis encourages States and communities to address target repetitive loss properties identified in the Agency's Repetitive Loss Strategy. These include structures with four or more losses, and structures with 2 or more losses where cumulative payments have exceeded the property value. State and communities are also encouraged to develop Plans that address the mitigation of these target repetitive loss properties.

APPENDIX C:
SAFFIR/SIMPSON HURRICANE SCALE

Courtesy of National Hurricane Center

This can be used to give an estimate of the potential property damage and flooding expected along the coast with a hurricane.

Category	Definition	Effects
One	Winds 74-95 mph	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal road flooding and minor pier damage
Two	Winds 96-110 mph	Some roofing material, door, and window damage to buildings. Considerable damage to vegetation, mobile homes, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of center. Small craft in unprotected anchorages break moorings.
Three	Winds 111-130 mph	Some structural damage to small residences and utility buildings with a minor amount of curtainwall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures with larger structures damaged by floating debris. Terrain continuously lower than 5 feet ASL may be flooded inland 8 miles or more.
Four	Winds 131-155 mph	More extensive curtainwall failures with some complete roof structure failure on small residences. Major erosion of beach. Major damage to lower floors of structures near the shore. Terrain continuously lower than 10 feet ASL may be flooded requiring massive evacuation of residential areas inland as far as 6 miles.
Five	Winds greater than 155 mph	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Major damage to lower floors of all structures located less than 15 feet ASL and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5 to 10 miles of the shoreline may be required.

Above information can be found at: http://www.fema.gov/hazards/hurricanes/saffir.shtm

Figure 2: Hurricane Landfall History

APPENDIX D:
FUJITA TORNADO DAMAGE SCALE

Developed in 1971 by T. Theodore Fujita of the University of Chicago

SCALE	WIND ESTIMATE *** (MPH)	TYPICAL DAMAGE
F0	< 73	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1	73-112	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	113-157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
F3	158-206	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
F5	261-318	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur.

*** IMPORTANT NOTE ABOUT F-SCALE WINDS: Do not use F-scale winds literally. These precise wind speed numbers are actually guesses and have never been scientifically verified. Different wind speeds may cause similar-looking damage from place to place -- even from building to building. Without a thorough engineering analysis of tornado damage in any event, the actual wind speeds needed to cause that damage are unknown.

Information depicted above can be found at: http://www.spc.noaa.gov/faq/tornado/f-scale.html

APPENDIX E:
THE RICHTER MAGNITUDE SCALE

Earthquake Severity

Magnitudes	Earthquake Effects
Less than 3.5	Generally not felt, but recorded.
3.5-5.4	Often felt, but rarely causes damage.
Under 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1-6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0-7.9	Major earthquake. Can cause serious damage over larger areas.
8 or greater	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Information above found at: http://www.seismo.unr.edu/ftp/pub/louie/class/100/magnitude.html

The Richter Magnitude Scale

Seismic waves are the vibrations from earthquakes that travel through the Earth; they are recorded on instruments called seismographs. Seismographs record a zig-zag trace that shows the varying amplitude of ground oscillations beneath the instrument. Sensitive seismographs, which greatly magnify these ground motions, can detect strong earthquakes from sources anywhere in the world. The time, locations, and magnitude of an earthquake can be determined from the data recorded by seismograph stations.

The Richter magnitude scale was developed in 1935 by Charles F. Richter of the California Institute of Technology as a mathematical device to compare the size of earthquakes. The magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs. Adjustments are included for the variation in the distance between the various seismographs and the epicenter of the earthquakes. On the Richter Scale, magnitude is expressed in whole numbers and decimal fractions. For example, a magnitude 5.3 might be computed for a moderate earthquake, and a strong earthquake might be rated as magnitude 6.3. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude; as an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

At first, the Richter Scale could be applied only to the records from instruments of identical manufacture. Now, instruments are carefully calibrated with respect to each other. Thus, magnitude can be computed from the record of any calibrated seismograph.

Earthquakes with magnitude of about 2.0 or less are usually call microearthquakes; they are not commonly felt by people and are generally recorded only on local seismographs. Events with magnitudes of about 4.5 or greater - there are several thousand such shocks annually - are strong enough to be recorded by sensitive seismographs all over the world. Great earthquakes, such as the 1964 Good Friday earthquake in Alaska, have magnitudes of 8.0 or higher. On the average, one earthquake of such size occurs somewhere in the world each year. The Richter Scale has no upper limit. Recently, another scale called the moment magnitude scale has been devised for more precise study of great earthquakes. The Richter Scale is not used to express damage. An earthquake in a densely populated area which results in many deaths and considerable damage may have the same magnitude as a shock in a remote area that does nothing more than frighten wildlife. Large-magnitude earthquakes that occur beneath the oceans may not even be felt by humans.

Above information can be found at: http://neic.usgs.gov/neis/general/handouts/richter.html

APPENDIX F:

Documentation of the Planning Process

ROCKINGHAM PLANNING COMMISSION

156 Water Street, Exeter, NH 03833
Tel. 603-778-0885 • Fax: 603-778-9183
email@rpc-nh.org • www.rpc-nh.org

September 15, 2011

Town of Exeter
20 Court Street
Exeter, NH 03833

Dear Prospective Exeter Hazard Mitigation Committee Member,

The federal government has mandated that all local communities complete and update every 5 years a Local All Hazard Mitigations Plan in order to qualify for future FEMA funding in case of a disaster. The Rockingham Planning Commission has received a grant to develop and update these Local All Hazards Mitigation Plans for Towns in the region and the Town of Exeter is one of them. There is no cost to the Town, other than your time participating in the planning process. The goal of the plan will be to reduce the personal and economic costs of hazard events in the community. This effort will enhance and strengthen the economic structure and long-term stability of the community, regardless of when a disaster strikes.

Through this planning process, projects are identified that will mitigate and make the next natural disaster to effect Exeter as undisruptive as possible. The goal is to enlist the support of community stakeholders to sponsor or support projects that help the community mitigate risk and future damages associated with storm events. The planning process does not happen overnight. It will take time for certain projects to be completed. However, the Local All Hazards Mitigation Plan is the document that will bring all pre-disaster mitigation efforts to a central location. The Town needs your input in developing this plan.

You have been selected by your local Emergency Management Director to serve as a member of the Local Hazards Mitigation Planning Committee for update of the Town of Exeter's Natural Hazards Mitigation Plan. Your status within the community and your knowledge and long term involvement would be most helpful. Your time commitment would involve a total of between 2 – 4 hours. This is a very structured program with many guidelines so time will not be wasted sitting around re-inventing the wheel. It is important that you not delegate this function but be willing to participate personally. We need to have decision-makers involved who have certain knowledge and responsibilities.

The first meeting to begin this plan update is scheduled for October 20th, 2011 @ 10am at the Exeter Fire Department, 20 Court Street. Please contact Exeter Fire Chief Brian Comeau if you can or can't attend.

Thank you for your serious consideration of this request.

Sincerely,

Dylan L Smith,
RPC Senior Planner

Natural Hazards Mitigation Plan Update Meeting
Town of Exeter, Fire Department
Division of Emergency Management

Exeter Public Safety Complex
20 Court Street
Exeter, New Hampshire 03833

October 19, 2011 - 10am

Agenda

1. **Welcome and Introduction**
   - Review of Hazard Mitigation Goals and Objectives

2. **Identify Hazards and conduct Risk Analysis**
   - What are the hazards? – Past and potential
   - What is at risk from those hazards?

3. **Develop Base Map with Critical Facilities (Step 2)**
   - Identify Critical Facilities on a Base Map.

4. **Vulnerability Assessment (Step 3)**
   - List hazards from hazards map - identify what is at risk/vulnerable
   - Estimate potential losses

5. **Capability Assessment (Step 5)**
   - Identify Existing Mitigation Strategies

6. **Questions and Answers**

7. **Set Goals & Date for Next Meeting**

Natural Hazards Mitigation Plan Update Meeting
Town of Exeter, Fire Department
Division of Emergency Management

Exeter Public Safety Complex
20 Court Street
Exeter, New Hampshire 03833

November 8, 2011 - 10am

Agenda
Meeting #2

1. **Welcome and Introduction**

2. **Capability Assessment (Step 6A)**
   - Review Critical Facilities/Past and Potential Hazards Map
   - Identify Existing Mitigation Strategies/ Projects
   - Identify New Mitigation Strategies/Projects

3. **Evaluate Each Strategy/Project (Step 6B)**
   - Using the STAPLEE METHOD

4. **Prioritize Proposed Mitigation Strategies (Step 7)**
   - Does the action reduce damage?
   - Does the action contribute to community objectives?
   - Does the action meet existing regulations?
   - Does the action protect historic structures?
   - Can the action be implemented quickly?

5. **Establish an implementation strategy for each new mitigation strategy defining the following three questions (Step 8)**
   - Who will lead the effort?
   - How will it be implemented? *(Technical and Financial resources)*
   - When will it take place?

6. **Discuss Monitoring, Updating and Adoption of Plan**

7. **Questions and Answers**

Natural Hazards Mitigation Plan Update Meeting
Town of Exeter, Fire Department
Division of Emergency Management

Exeter Public Safety Complex
20 Court Street
Exeter, New Hampshire 03833

December 6, 2011 - 11am

Agenda
Meeting #3

1. **Welcome and Introduction**

2. **Capability Assessment (Step 6A)**
   - Review of new mitigation strategies/projects

3. **Evaluate Each Strategy/Project (Step 6B)**
   - Using the STAPLEE METHOD

4. **Prioritize Proposed Mitigation Strategies (Step 7)**
   - Does the action reduce damage?
   - Does the action contribute to community objectives?
   - Does the action meet existing regulations?
   - Does the action protect historic structures?
   - Can the action be implemented quickly?

5. **Establish an implementation strategy for each new mitigation strategy defining the following three questions (Step 8)**
   - Who will lead the effort?
   - How will it be implemented? *(Technical and Financial resources)*
   - When will it take place?

6. **Discuss Monitoring, Updating and Adoption of Plan**

7. **Questions and Answers**

Natural Hazards Mitigation Plan Update Meeting
Town of Exeter, Fire Department
Division of Emergency Management

Exeter Public Safety Complex
20 Court Street
Exeter, New Hampshire 03833

January 4, 2012 - 11am

Agenda
Meeting #4

Continuation of Meeting #4, held on December 6, 2012

1. **Welcome and Introduction**

5. **Establish an implementation strategy for each new mitigation strategy defining the following three questions (Step 8)**
   - Who will lead the effort?
   - How will it be implemented? *(Technical and Financial resources)*
   - When will it take place?

6. **Discuss Monitoring, Updating and Adoption of Plan**

7. **Questions and Answers**

Natural Hazards Mitigation Plan Update Meeting
Town of Exeter, Fire Department
Division of Emergency Management

Exeter Public Safety Complex
20 Court Street
Exeter, New Hampshire 03833

January 18, 2012 - 11am

Agenda
Meeting #5

Review of updated DRAFT document.

- Review of Hazard Mitigation Goals and Objectives
- Review the hazards & risks? – Past and potential
- Review Critical Facilities on a Base Map.
- Review hazards from hazards map - identify what is at risk/vulnerable
- Estimate potential losses
- Review New & Existing Mitigation Strategies
- Confirm who will lead the effort, and how will it be implemented?
- Review when will it take place?

- Review the STAPLEE METHOD and priorities.
- Does the action reduce damage?
- Does the action contribute to community objectives?
- Does the action meet existing regulations?
- Does the action protect historic structures?
- Can the action be implemented quickly?

Discuss Monitoring, Updating and Adoption of Plan

Questions and Answers

Exeter Board of Selectmen Meeting
Monday, May 21st, 2012 7:00 p.m.
Nowak Room, Town Office Building
10 Front Street, Exeter, NH

BUSINESS MEETING TO BEGIN AT 7:00 P.M.

1. Call Meeting to Order
2. Public Comment
3. Minutes & Proclamations
   a. Regular Meeting: May 7th, 2012
4. Appointments
5. Discussion/Action Items
   a. New Business
      i. Public Hearing: Fire Training Funds
      ii. Emergency Plan Update – Emergency Management
      iii. Sustainability Initiative: RPC
      iv. Grant Designation: CLG Grant
      v. Resignation of Town Treasurer
   b. Old Business-
      i. License Agreement – 1 Hampton Road
      ii. Private I and I Program Outline
      iii. Review Street Sweeper Operation
      iv. Bid Awards: Sidewalk Tractor
      v. Town Offices Discussion
6. Regular Business
   a. Bid Openings
   b. A/P and Payroll Manifests
   c. Budget Updates
   d. Tax Abatements & Exemptions
   e. Water/Sewer Abatements
   f. Permits
   g. Town Manager's Report
   h. Legislative Update
   i. Selectmen's Committee Reports
   j. Correspondence
7. Review Board Calendar
8. Adjournment

Matt Quandt, Chairman
Board of Selectmen

Posted: 5/18/12 Town Offices, Library, and Departments

Persons may request an accommodation for a disabling condition in order to attend this meeting. It is asked that such requests be made with 72 hours notice. If you do not make such a request, you may do so with the Town Manager prior to the start of the meeting. No requests will be considered once the meeting has begun.

BOARD OF SELECTMEN

BOARD OF SELECTMEN DRAFT MINUTES MAY 21, 2012

1. **Call Meeting to Order**

Chairman Matt Quandt called the meeting to order at 7:00 pm in the Nowak Room of the Town Offices. Other members of the Board present were Selectman Frank Ferraro, Selectman Don Clement, Selectman Dan Chartrand, Selectwoman Julie Gilman and Russ Dean, Town Manager.

2. **Public Comment**

Don Woodward, Exeter Resident comes forward to express his appreciation to the Board for their support in retaining a grant for the manufactured home cooperative he resides in. He also wishes to thank Christine Szostak of the Building and Planning Department for her assistance in the application for the grant. He notes that Exeter is recognized as the only town in Rockingham County to receive this kind of grant and while they did not get the full $1,000,000 they were hoping for, the funds they did receive will contribute to the cost of repairing over a hundred homes in the park.

Renee' O'Barton, Exeter resident comes forward to request an update in the near future on the Water Street projects. Chairman Quandt calls upon Jennifer Perry, Director of DPW to compose an update for an upcoming meeting.

Brian Griset, Exeter resident comes forward to inquire why the Selectman's Goal Setting sessions were held at the DPW as opposed to in the Town Offices. Chairman Quandt advises him that the meetings are very informal and tend to take place in a casual atmosphere. Mr. Chartrand adds that the Goal Setting Session was held at the Chamber of Commerce last year, thus setting the precedent. Mr. Griset inquires if due public notice was given and Chairman Quandt indicates that it was. Mr. Griset also expresses his concern that he has heard no response to his inquiry on the policy and procedure regarding what email correspondence goes into the Board of Selectman packet. He recounts a request he made several meetings ago as to the policy on who decides what correspondence goes in and what does not. Chairman Quandt indicates as the Chairman, he has final say on what does or does not go into the Selectman's packet.

3. **Minutes & Proclamations**
   a. Regular Meeting: May 7, 2012

Mr. Chartrand moves to accept the minutes of the May 7, 2012 meeting as presented to the Board. Mr. Clement Seconds. Vote: Unanimous.

4. **Appointments - None**

5. **Discussion / Action Items**
   a. New Business
      i. Public Hearing: Fire Training Funds

Mr. Clement moves to open the public hearing on Fire Training Funds. Mr. Chartrand Seconds. Vote: Unanimous

Assistant Fire Chief, Ken Berkenbush comes forward to summarize the grants available to the Town of Exeter Fire Department. As he has presented to the Board at previous meetings, the Fire Department employees are eligible for part of a $4,400,000 grant that will fund classes for firefighters in New Hampshire. The grant includes compensation for overtime, if required, and for back filling the positions of the firefighters attending classes. He expresses that the Department has this opportunity to take the time and go to as many trainings as they can. There are no questions or comments from the public. Chairman Quandt closes the public hearing.

Mr. Chartrand moves the Board of Selectman accept up to $90,000 in unanticipated grant funds from the Department of Safety for firefighter training purposes. Ms. Gilman Seconds. Vote: Unanimous.

ii. Emergency Plan Update – Emergency Management

Assistant Fire Chief, Ken Berkenbush introduces Dylan Smith, Senior Planner for Rockingham Planning Commission.

Mr. Ferraro moves the Board of Selectmen allow Mr. Smith to speak before the Board as he is not an Exeter resident. Mr. Clement Seconds. Vote: Unanimous.

Mr. Smith presents a summary of the grant offered annually from NH Homeland Security Management to conduct updates to municipalities Emergency Management Plans. Exeter was on the schedule for an update to the plan. He summarizes the ten step process of looking into the potential hazards and brainstorming of new mitigation answers to those potential hazards. He advises that this presentation is a formality required by FEMA prior to submittal of a plan update, affording the residents of Exeter the opportunity to express their opinions or concerns. Mr. Clement comments that he has read the plan update and it is very thorough. He asks Chairman Quandt if this update needs to be voted upon by the Board now. Chairman Quandt advises that voting on the adoption of the updated plan can be put off for another meeting. Mr. Clement expresses his concerns regarding some of the proposed mitigations. He wonders if the Board approves and adopts this plan update, is it implied consent that the Town of Exeter will then go ahead with some of the projects in the Capital Improvement Program. He notes some of the proposed projects will extend to the year 2017. Mr. Berkenbush indicates that any questions can be directed to himself, RPC or any fire or safety official. Mr. Clement expresses his desire to offer his input regarding the Exeter River flooding issue. Mr. Berkenbush indicates another public meeting will be necessary before the updates to the plan can be adopted by the Board of Selectmen and he would like to have all the questions and comments resolved as quickly as possible. He advises that the capital projects recommended at the back of the presentation are recommendations. There is nothing that will bind the Town of Exeter to these projects, as all capital expense projects require a vote by the Town residents. Mr. Clement clarifies that should the Board adopt this update, the document will go on file as a working document and can be critical to securing future grants. Mr. Smith advises that at the back of the presentation there is an appendix. This is a list of projects regarding Hazard Mitigation Assistance Programs. These are a slew of pre-disaster grants the Town of Exeter would then be eligible to apply for, assuming the Selectmen adopt the updated plan. He hopes the Selectman would recognize this and utilize some of the parts of the plan in going through review of other Town Operations Plans, including the Master Plan. Mr. Clement requests the document be uploaded to the Town Website for public review and possible public comment. Mr. Berkenbush reflects on a few of the disasters the Town of Exeter has seen over the years, in his experience a document such as this is critical. Submittal of the plan to FEMA would make the Town eligible for FEMA reimbursement in the event of an emergency. Mr. Smith reminds the Board that the current Emergency Plan is out of date. His recommendation is to submit the adopted plan to FEMA as quickly as possible for conditional approval.

iii. Sustainability Initiative: RPC

Glen Greenwood, Assistant Director of the Rockingham Planning Commission comes forward to present a program that has been awarded to the Planning Commission of Exeter, NH.

Mr. Clement moves the Board of Selectman allow Mr. Greenwood to speak before the Board, as he is not an Exeter resident. Mr. Ferraro Seconds. Vote: Unanimous.

Mr. Greenwood summarizes this as the first time the Regional Planning Commission Association's of New Hampshire have attempted federal funding on a large scale, from the Department of Housing and Urban Development. The grant is for sustainability. The grant was successfully secured by the Rockingham Planning Commission and he expresses his appreciation in the Town of Exeter agreeing to participate in the program in order to have the application for the grant accepted. He points out that participation by the Town of Exeter comes with no monetary requirement, only that the Town elect a few member Commissioners in the three year initiative. In finalizing the nine Regional Commissions across the state, utilizing funds from this grant, the goal is to assist the State of New Hampshire to finish the development of the state wide Development Plan. He notes the process is already underway and several meetings have already taken place. He hopes his presentation this evening will entice some Exeter residents to attend any upcoming meetings or listening forums and participate at their convenience, as the public perspective is critical to the process of developing and finalizing this plan. The finalized Regional Development Plan will serve as an advisory document for communities to use in preparation of their own Master Plans. A number of chapters that the Commission would otherwise not have funds to develop will be addressed. The program is named "Granite State Future." He notes the regional plan is being developed in conjunction with the eight other regions in the State. Mr. Chartrand asks for clarification of the expectation to the residents of Exeter. As he understands it, any resident can participate in any meeting and asks for the procedure for residents wishing to have sustained participation. Mr. Greenwood advises that the DHUD is requiring a more broad scope of public participation than the Planning Commission is used to. Part of the requirement is that outreach is diligent to ensure a fully body representation of the general public is available. The goal of the "equity group" is to ensure all residents are encouraged to participate. The topics and areas of upcoming meetings and open visioning sessions will be posted

Exeter Board of Selectmen Meeting
Monday, June 25th, 2012, 6:30 p.m.
Nowak Room, Town Office Building
10 Front Street, Exeter, NH

BUSINESS MEETING TO BEGIN AT 7:00 P.M.

1. Call Meeting to Order
2. Board Interviews
3. Public Comment
4. Minutes & Proclamations
   a. Regular Meetings: May 18th, 2012
   b. Regular Meetings: June 4th, 2012
5. Appointments – Planning Board, Arts Committee
6. Discussion/Action Items
   a. New Business
      i. Public Hearing: Emergency Plan
      ii. Interim Town Treasurer Appointment
      iii. Formation of 375th Anniversary Committee
      iv. Discussion: Employee of Year Award
   b. Old Business-
      i. Update on Commercial Dock Ordinance/Waiver
7. Regular Business
   a. Bid Openings
   b. A/P and Payroll Manifests
   c. Budget Updates
   d. Abatements & Exemptions
   e. Permits
   f. Town Manager's Report
   g. Legislative Update
   h. Selectmen's Committee Reports
   i. Correspondence
8. Review Board Calendar
9. Adjournment

Matt Quandt, Chairman
Board of Selectmen

Posted: 6/22/12 Town Office, Town Hall, Website
Distribution: Town Departments

Persons may request an accommodation for a disabling condition in order to attend this meeting. It is asked that such requests be made with 72 hours notice. If you do not make such a request, you may do so with the Town Manager prior to the start of the meeting. No requests will be considered once the meeting has begun.

APPENDIX G:

Approval Letters from Town Governing Body and FEMA

U.S. Department of Homeland Security
FEMA Region I
99 High Street, Sixth Floor
Boston, MA 02110-2132

FEMA

MAY 21 2013

Donald Clement, Chairman
Board of Selectmen
Town of Exeter
10 Front Street
Exeter, NH 03833

Dear Mr. Clement:

Thank you for the opportunity to review the Town of Exeter, NH Natural Hazard Mitigation Plan Update 2013. The Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA) Region I has evaluated the plan for compliance with 44 C.F.R. Pt. 201. The plan satisfactorily meets all of the mandatory requirements set forth by the regulations.

With this plan approval, the Town of Exeter is eligible to apply to New Hampshire Homeland Security and Emergency Management for mitigation grants administered by FEMA. Requests for mitigation funding will be evaluated individually according to the specific eligibility requirements identified for each of these programs. A specific mitigation activity or project identified in your community's plan may not meet the eligibility requirements for FEMA funding; even eligible mitigation activities or projects are not automatically approved.

Approved mitigation plans are eligible for points under the National Flood Insurance Program's Community Rating System (CRS). Complete information regarding the CRS can be found at **www.fema.gov/business/nfip/crs.shtm,** or through your local floodplain administrator.

The Town of Exeter, NH Natural Hazard Mitigation Plan Update 2013 must be reviewed, revised as appropriate, and resubmitted to FEMA for approval within **five years of the plan approval date of May 8, 2013** in order to maintain eligibility for mitigation grant funding. Over the next five years, we encourage the Town to continue updating the plan's assessment of vulnerability, adhere to its maintenance schedule, and begin implementing, when possible, the mitigation actions proposed in the plan.

Once again, thank you for your continued dedication to public service demonstrated by preparing and adopting a strategy for reducing future disaster losses. Should you have any questions, please do not hesitate to contact Marilyn Hilliard at (617) 956-7536.

Sincerely,

Paul F. Ford
Acting Regional Administrator

PFF:mh

cc: Beth Peck, Acting New Hampshire State Hazard Mitigation Officer
Jennifer Gilbert, Asst. New Hampshire State NFIP Coordinator
Dylan Smith, Planner Rockingham Planning Commission
Eric Wilking, Deputy EMD/Asst. Fire Chief

Enclosure